

# DR-135 / 435FX

## Service Manual

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# SPECIFICATIONS

## ■ General

Frequency coverage	DR-135		DR-435	
FX	136.000 ~ 173.995MHz ( RX, TX )		350.000 ~ 511.995MHz ( RX ) 400.000 ~ 489.995MHz ( TX )	
FXE	144.000 ~ 145.995MHz ( RX, TX )		430.000 ~ 439.995MHz ( RX, TX )	

Operating mode	FM 16K0F3E ( Wide mode ) 8K50F3E ( Narrow mode )			
Frequency resolution	5 , 8.33 , 10 , 12.5 , 15 , 20 , 25 , 30 , 50 kHz			
Number of memory Channels	100			
Antenna impedance	50ohm unbalanced			
Power requirement	13.8V DC +/- 15% ( 11.7 ~ 15.8 V )			
Ground method	Negative ground			
Current drain	Receive	0.6 A ( max. )		0.4 A ( Squelched )
	Transmit	Approx. 12.0 A max.		
Operating temperature	-10 °C ~ 60°C			
Frequency stability	+/- 5ppm		+/- 2.5 ppm	
Dimensions	142 ( w ) x 40 ( h ) x 174 ( d ) mm			
	( 142 x 40 x 188 mm for projection included )			
Weight	Approx. 1.0 Kg			

## ■ Transmitter

Output power	Hi	50 W	35 W
	Mid	20 W	20 W
	Low	Approx. 5 W	Approx. 5 W
Modulation system	Variable reactance frequency modulation		
Maximum Frequency deviation	+/- 5kHz ( Wide mode ) +/- 2.5kHz ( Narrow mode )		
Spurious emission	- 60 dB		
Adjacent channel power	- 60 dB		
Noise and hum ratio	- 40 dB ( Wide mode ) - 34 dB ( Narrow mode )		
Microphone impedance	2kohm		

## ■ Receiver

Sensitivity	- 14 dBu for 12 dB SINAD		
Receiver circuit	Double conversion super-heterodyne		
Intermediate frequency	1st 21.7 MHz	2nd 450kHz	1st 30.85 MHz 2nd 455kHz
Squelch sensitivity	- 18 dBu		
Adjacent channel selectivity	- 65 dB ( Wide mode ) - 55 dB ( Narrow mode )		
Inter-modulation rejection ratio	60 dB		
Spurious and image rejection ratio	70 dB		
Audio output power	2.0 W ( 8ohm , 10 % THD )		

! NOTE : All specifications are subject to change without notice or obligation.

# CIRCUIT DESCRIPTION

## 1) Receiver System DR- 135

The receiver system is a double super-heterodyne system with a 21.7MHz first IF and a 450kHz second IF.

### 1. Front End

The received signal at any frequency in the 136.000MHz to 173.995MHz range is passed through the low-pass filter (L116, L115, L114, L113, C204, C203, C202, C216 and C215) and tuning circuit (L105, L104 and D105, D104), and amplified by the RF amplifier (Q107). The signal from Q107 is then passed through the tuning circuit (L103, L102, and variable capacitor D103, D102) and converted into 21.7MHz by the mixer (Q106). The tuning circuit, which consists of L105, L104, variable capacitor D105 and D104, L103, L102, variable capacitor D103 and D102, is controlled by the tracking voltage from the VCO. The local signal from the VCO is passed through the buffer (Q145), and supplied to the source of the mixer (Q106). The radio uses the lower side of the super-heterodyne system.

### 2. IF Circuit

The mixer mixes the received signal with the local signal to obtain the sum of and difference between them. The crystal filter (XF102, XF101) selects 21.7 MHz frequency from the results and eliminates the signal of the unwanted frequencies. The first IF amplifier (Q105) then amplifies the signal of the selected frequency.

### 3. Demodulation Circuit

After the signal is amplified by the first IF amplifier (Q105), it is input to pin16 of the demodulator IC (IC108). The second local signal of 21.25MHz (shared with PLL IC reference oscillation), which is oscillated the external oscillator X601 and IC601, is input through pin 1 of IC108. Then, these two signals are mixed by the internal mixer in IC108 and the result is converted into the second IF signal with a frequency of 450kHz. The second IF signal is output from pin 3 of IC108 to the ceramic filter (FL102 or FL101), where the unwanted frequency band of that signal is eliminated, and the resulting signal is sent back to the IC108 through pin 5. The second IF signal input via pin 5 is demodulated by the internal limiter amplifier and quadrature detection circuit in IC 108, and output as an audio signal through pin 9.

### 4. Audio Circuit

The audio signal from pin 9 of IC 108 is amplified by the audio amplifier (IC120:A), and switched by the signal switch IC (IC111) and then input it to the de-emphasis circuit.

And is compensated to the audio frequency characteristics in the de-emphasis circuit (R203, R207, R213, R209, C191, C218, C217) and amplified by the AF amplifier (IC120:B). The signal is then input to volume (VR1). The adjusted signal is sent to the audio power amplifier (IC117) through the pin 1 to drive the speaker.

## 5. Squelch Circuit

The detected output which is outputted from pin 9 of IC108 is inputted to pin 8 of IC108 after it was been amplified IC120:A and it is outputted from pin 7 after the noise component was been eliminated from the composed band pass filter in the built in amplifier of the IC, then the signal is rectified by the internal diode in IC108 to convert into DC component. The adjusted voltage level at VR101 is delivered to the comparator of the CPU.

The voltage is led to pin 2 of CPU and compared with the setting voltage. The squelch will open if the input voltage is lower than the setting voltage. During open squelch, pin 30 (SQC) of the CPU becomes "L" level, AF control signal is begin controlled and sounds is outputted from speaker.

## 6. WIDE/NARROW Switching circuit

The second IF 450kHz signal which passes through filter FL101 (wide) and FL102 (narrow) during narrow, changes its width using the width control switching D116 and D115.

# 2) Transmitter System DR- 135

## 1. Modulator Circuit

The audio signal is converted to an electrical signal by the microphone, and input it to the microphone amplifier (Q6). Amplified signal which passes through mic-mute control IC109 is adjusted to an appropriate mic-volume by means of mic-gain adjust VR106.

IC114:D and C consists of two operational amplifiers; one amplifier (pin 12, 13 and 14) is composed of pre-emphasis and IDC circuit and the other (pin 8, 9 and 10) is composed of a splatter filter. The maximum frequency deviation is obtained by VR107. And input to the signal switch (IC113) (9600 bps packet signal input switch) and input to the cathode of the variable capacitor of the VCO, to change the electric capacity in the oscillation circuit. This produces the frequency modulation.

## 2. Power Amplifier Circuit

The transmitted signal is oscillated by the VCO, amplified by the younger amplifier (Q115), and input to the final power module (IC110). The signal is then amplified by the final power module (IC110) and led to the antenna switch (D110) and low-pass filter (L113, L114, L115, L116, C215, C216, C202, C203 and C204), where unwanted high harmonic waves are reduced as needed, and the resulting signal is supplied to the antenna.

## 3. APC Circuit

Part of the transmission power from the low-pass filter is detected by D111, converted to DC. The detection voltage is passed through the APC circuit (IC114:A, IC114:B), then it controls the APC voltage supplied to final power module IC110 to fix the transmission power.

# 3) PLL Synthesizer Circuit DR- 135

## 1. PLL

The dividing ratio is obtained by sending data from CPU (IC1) to pin 10 and sending clock pulses to pin 9 of the PLL IC (IC116). The oscillated signal from the VCO is amplified by the buffer (Q134 and Q135) and input to pin 8 of IC116. Each programmable divider in IC116 divides the frequency of the input signal by N according to the frequency data, to generate a comparison frequency of 5 or 6.25 kHz.

## 2. Reference Frequency Circuit

The reference frequency appropriate for the channel steps is obtained by dividing the 21.25 MHz reference oscillation (X102) by 4250 or 3400, according to the data from the CPU (IC1). When the resulting frequency is 5 kHz, channel step of 5, 10, 15, 20, 25, 30 and 50 kHz are used. When it is 6.25 kHz, the 12.5 kHz channel step is used.

## 3. Phase Comparator Circuit

The PLL (IC116) uses the reference frequency, 5 or 6.25 kHz. The phase comparator in the IC116 compares the phase of the frequency from the VCO with that of the comparison frequency, 5 or 6.25 kHz, which is obtained by the internal divider in IC116.

## 4. PLL Loop Filter Circuit

If a phase difference is found in the phase comparison between the reference frequency and the VCO output frequency, the charge pump output (pin 5) of IC116 generates a pulse signal, which is converted DC voltage by the PLL loop filter and input to the input to the variable capacitor of the VCO unit for oscillation frequency control.

## 5. VCO Circuit

A Colpitts oscillation circuit driven by Q131 directly oscillates the desired frequency. The frequency control voltage determine in the CPU (IC1) and PLL circuit is input to the variable capacitor (D122 and D123). This change the oscillation frequency, which is amplified by the VCO buffer (Q134, Q145) and output from the VCO area.

## 6. VCO Shift Circuit

During transmission or the AIR band Reception (118 ~ 136 MHz), the VCO shift circuit turns ON Q138, change control the capacitance of L123 and safely oscillates the VCO by means of H signal from pin 42 of IC1.

# 4) Receiver System DR- 435

The receiver system is a double super-heterodyne system with a 30.85MHz first IF and a 455kHz second IF.

## 1. Front End

The received signal at any frequency in the 430.000MHz to 439.995MHz range is passed through the low-pass filter ( L115, L114, L116, C204, C203, C202, C216 and C215) and amplified by the RF amplifier (Q107). The signal from Q107 is then passed through the BPF circuit (L103, L102) and converted into 30.85MHz by the mixer (Q106). The local signal from the VCO is passed through the buffer (Q134, Q145), and supplied to the source of the mixer (Q106). The radio uses the lower side of the super-heterodyne system.

## 2. IF Circuit

The mixer mixes the received signal with the local signal to obtain the sum of and difference between them. The crystal filter (XF101) selects 30.85 MHz frequency from the results and eliminates the signal of the unwanted frequencies. The first IF amplifier (Q105) then amplifies the signal of the selected frequency.

### 3. Demodulation Circuit

After the signal is amplified by the first IF amplifier (Q105), it is input to pin16 of the demodulator IC (IC108). The second local signal of 30.395MHz (Crystal oscillator) is input through pin 1 of IC108. Then, these two signals are mixed by the internal mixer in IC108 and the result is converted into the second IF signal with a frequency of 455kHz. The second IF signal is output from pin 3 of IC108 to the ceramic filter (FL101 or FL102), where the unwanted frequency band of that signal is eliminated, and the resulting signal is sent back to the IC108 through pin 5.

The second IF signal input via pin 5 is demodulated by the internal limiter amplifier and quadrature detection circuit in IC 108, and output as an audio signal through pin 9.

### 4. Audio Circuit

The audio signal from pin 9 of IC 108 is amplified by the audio amplifier (IC120:A), and switched by the signal switch IC (IC111) and then input it to the de-emphasis circuit.

And is compensated to the audio frequency characteristics in the de-emphasis circuit (R203, R207, R213, R209, C191, C218, C217) and amplified by the AF amplifier (IC120:B). The signal is then input to volume (VR1). The adjusted signal is sent to the audio power amplifier (IC117) through the pin 1 to drive the speaker.

### 5. Squelch Circuit

The detected output which is outputted from pin 9 of IC108 is inputted to pin 8 of IC108 after it was been amplified IC120:A and it is outputted from pin 7 after the noise component was been eliminated from the composed band pass filter in the built in amplifier of the IC, then the signal is rectified by the internal diode in IC108 to convert into DC component. The adjusted voltage level at VR101 is delivered to the comparator of the CPU.

The voltage is led to pin 2 of CPU and compared with the setting voltage. The squelch will open if the input voltage is lower than the setting voltage. During open squelch, pin 30 (SQC) of the CPU becomes "L" level, AF control signal is begin controlled and sounds is outputted from speaker.

### 6. WIDE/NARROW Switching circuit

The second IF 455kHz signal which passes through filter FL101 (wide) and FL102 (narrow) during narrow, changes its width using the width control switching D116 and D115.

## 5) Transmitter System DR- 435

### 1. Modulator Circuit

The audio signal is converted to an electrical signal by the microphone, and input it to the microphone amplifier (Q6). Amplified signal which passes through mic-mute control IC109 is adjusted to an appropriate mic-volume by means of mic-gain adjust VR106.

IC114:D and C consists of two operational amplifiers; one amplifier (pin 12, 13 and 14) is composed of pre-emphasis and IDC circuit and the other (pin 8, 9 and 10) is composed of a splatter filter. The maximum frequency deviation is obtained by VR107. And input to the signal switch (IC113) (9600 bps packet signal input switch) and input to the cathode of the variable capacitor of the VCO, to change the electric capacity in the oscillation circuit. This produces the frequency modulation.

## 2. Power Amplifier Circuit

The transmitted signal is oscillated by the VCO, amplified by the drive amplifier (Q138) and younger amplifier (Q115), and input to the final power module (IC110). The signal is then amplified by the final power module (IC110) and led to the antenna switch (D110) and low-pass filter (L116, L114, L115, C215, C216, C202, C203 and C204), where unwanted high harmonic waves are reduced as needed, and the resulting signal is supplied to the antenna.

## 3. APC Circuit

Part of the transmission power from the low-pass filter is detected by D111, converted to DC. The detection voltage is passed through the APC circuit (IC114:A, IC114:B), then it controls the APC voltage supplied to the final power module IC110 to fix the transmission power.

## 6) PLL Synthesizer Circuit DR- 435

### 1. PLL

The dividing ratio is obtained by sending data from CPU (IC1) to pin 10 and sending clock pulses to pin 9 of the PLL IC (IC116). The oscillated signal from the VCO is amplified by the buffer (Q134 and Q135) and input to pin 8 of IC116. Each programmable divider in IC116 divides the frequency of the input signal by N according to the frequency data, to generate a comparison frequency of 5 or 6.25 kHz.

### 2. Reference Frequency Circuit

The reference frequency appropriate for the channel steps is obtained by dividing the 21.25 MHz reference oscillation (X102) by 4250 or 3400, according to the data from the CPU (IC1). When the resulting frequency is 5 kHz, channel step of 5, 10, 15, 20, 25, 30 and 50 kHz are used. When it is 6.25 kHz, the 12.5 kHz channel step is used.

### 3. Phase Comparator Circuit

The PLL (IC116) uses the reference frequency, 5 or 6.25 kHz. The phase comparator in the IC116 compares the phase of the frequency from the VCO with that of the comparison frequency, 5 or 6.25 kHz, which is obtained by the internal divider in IC116.

### 4. PLL Loop Filter Circuit

If a phase difference is found in the phase comparison between the reference frequency and the VCO output frequency, the charge pump output (pin 5) of IC116 generates a pulse signal, which is converted DC voltage by the PLL loop filter and input to the input to the variable capacitor of the VCO unit for oscillation frequency control.

### 5. VCO Circuit

A Colpitts oscillation circuit driven by Q131 directly oscillates the desired frequency. The frequency control voltage determine in the CPU (IC1) and PLL circuit is input to the variable capacitor (D122 and D123). This change the oscillation frequency, which is amplified by the VCO buffer (Q134, Q145) and output from the VCO unit.

## 7) CPU and Peripheral Circuits

### 1. LCD Display Circuit

The CPU turns ON the LCD via segment and common terminals with 1/4 the duty and 1/3 the bias, at the frame frequency is 64 Hz.

### 2. Reset and Backup

When the power from the DC cable increases from Circuits 0 V to 2.5 V or more, "H" level reset signal is output from the reset IC (IC4) to pin 33 of the CPU (IC1), causing the CPU to reset. The reset signal, however, waits at 100, and does not enter the CPU until the CPU clock (X1) has stabilized.

### 3. S (Signal) Meter Circuit

The DC potential of IF IC is input to pin 1 of the CPU (IC1), converted from an analog to a digital signal, and displayed as the S-meter signal on the LCD.

### 4. DTMF Encoder

The CPU (IC1) is equipped with an internal DTMF encoder. The DTMF signal is output from pin 10, through R35, R34 and R261 (for level adjustment), and then through the microphone amplifier (IC114:A), and is sent to the variable capacitor of the VCO for modulation. At the same time, the monitoring tone passes through the AF circuit and is output from the speaker.

### 5. Tone Encoder

The CPU (IC1) is equipped with an internal tone encoder. The tone signal (67.0 to 250.3 Hz) is output from pin 9 of CPU to the variable capacitor (D122 and D123) of the VCO for modulation.

### 6. DCS Encoder

The CPU (IC1) is equipped with an internal DCS code encoder. The code (023 to 754) is output from pin 9 of CPU to the voltage control pin of VCTCXO (X102) of the PLL reference oscillator. When DCS is ON, DCS MUTE circuit (Q126-ON, Q133-ON, Q132-OFF) works. The modulation activates in X102 side only.

### 7. CTCSS, DCS Decoder

The voice band of the AF output signal from pin 1 of IC120:A is cut by sharp active filter IC104:A, B and C (VCVS) and amplified, then led to pin 4 of CPU. The input signal is compared with the programmed tone frequency code in the CPU. The squelch will open when they match. During DCS, Q108 is ON, C419 is working and cut off frequency is lowered.

## 8) Power Supply Circuit

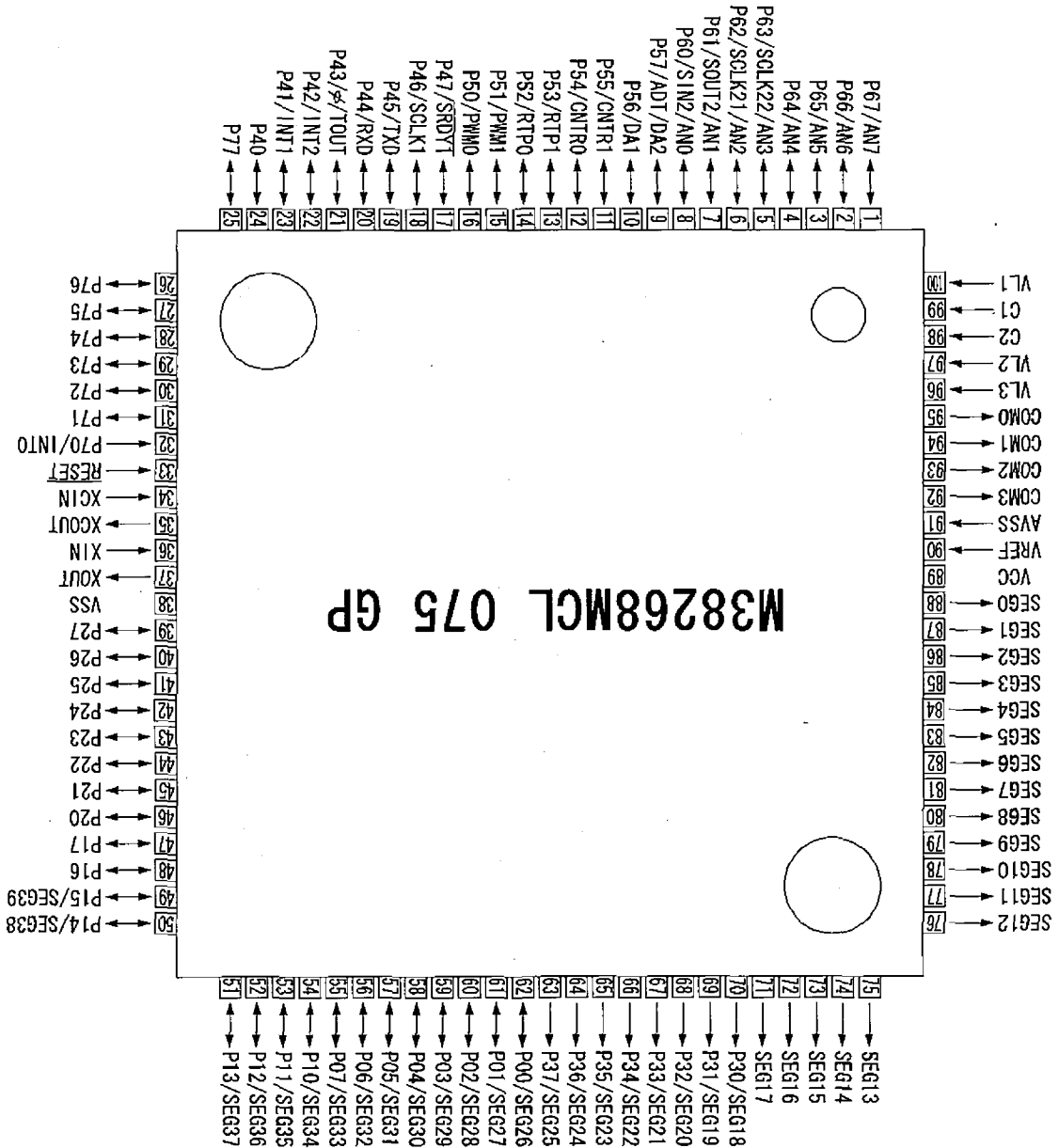
When power supply is ON, there is a "L" signal being inputted to pin 39 (PSW) of CPU which enables the CPU to work. Then, "H" signal is outputted from pin 41 (C5C) of CPU and drives ON the power supply switch control Q8 and Q7 which turns the 5VS ON. 5VS turns ON the PLL IC (IC116), main power supply switch Q127 and Q122, AF POWER IC117 and the 8V of AVR (IC115). During reception, pin 29 (R5) of CPU outputs "H" level, Q124 is ON, and the reception circuits supplied by 8 V. While during transmission, pin 28 (T5) of CPU outputs "L" level which is reverse by Q11 so that the output in Q128 will be "H" level, Q123 is ON, and the transmission circuit is supplied by 8 V. Or, in the case when the condition of PLL is UNLOCK, "H" level is outputted from pin 14 of PLL IC, UNLOCK switch Q129 is ON, transmission switch Q128 is OFF which makes the transmission to stop.



# 9) M38268MCL075GP (XA1130)

CPU

Terminal Connection  
(TOP VIEW)



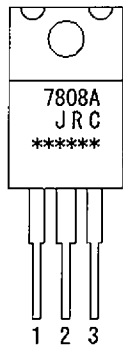
No.	Terminal	Signal	I/O	Description
1	P67/AN7	SMT	I	S-meter input
2	P66/AN6	SQL	I	Noise level input for squelch
3	P65/AN5	BP5	I	Band plan 5
4	P64/AN4	TIN	I	CTCSS tone input / DCS code input
5	P63/SCLK22/AN3	BP1	I	Band plan 1
6	P62/SCLK21/AN2	BP2	I	Band plan 2
7	P61/SOUT2/AN1	DCSW	O	DCS signal mute
8	P60/SIN2/AN0	RE2	I	Rotary encoder input
9	P57/ADT/DA2	TOUT	O	CTCSS tone output / DCS tone output
10	P56/DA1	DOUT	O	DTMF output
11	P55/CNTR1	SCL	O	Serial clock for EEPROM
12	P54/CNTR0	TBST	O	Tone burst output
13	P53/RTP1	BP4	I/O	Band plan 4
14	P52/RTP0	MUTE	I/O	Microphone mute / Security alarm SW
15	P51/PWM1	CLK	O	Serial clock output for PLL
16	P50/PWM0	DATA	I/O	Serial data output for PLL / PLL unlock signal input
17	P47/SRDY1	TSTB	I/O	Trunking board detection / Strobe signal to trunking board
18	P46/SCLK1	STB	O	Strobe for PLL IC
19	P45/TXD	UTX	O	UART data transmission output
20	P44/RXD	RTX	I	UART data reception output
21	P43/p/TOUT	BEEP	I/O	Beep tone / Band plan 3
22	P42/INT2	SEC	I	Security voltage input
23	P41/INT1	RE1	I	Rotary encoder input
24	P40			
25	P77	PTT	I	PTT input
26	P76	SSTB	O	Security mode
27	P75	W/N	O	Wide Narrow SW
28	P74	T5	O	TX power ON / OFF output
29	P73	R5	O	RX power ON / OFF output
30	P72	SQC	O	SQL ON / OFF
31	P71			
32	P70/INT0	BU	I	Backup signal detection input
33	RESET	RESET	I	Reset input
34	XCIN	Xcin	-	-
35	XCOU	Xcout	-	-
36	XIN	Xin	-	Main clock input
37	XOUT	Xout	-	Main clock output
38	VSS	GND	-	CPU GND
39	P27	PSW	I	Power switch input
40	P26	SDA	O	Serial data for EEPROM
41	P25	C5C	O	C5V power ON / OFF output
42	P24	AIR	O	Tx middle power
43	P23	LOW	O	Tx low power
44	P22	EXP	O	Trunking / Packet data SW
45	P21	SW6	I	Key sw 6 (SQL)
46	P20	SW5	I	Key sw 5 (CALL)
47	P17	SW4	I	Key sw 4 (TSQ)
48	P16	SW3	I	Key sw 3 (MHz)
49	P15/SEG39	SW2	I	Key sw 2 (V/M)
50	P14/SEG38	SW1	I	Key sw 1 (FUNC)

No.	Terminal	Signal	I/O	Description
51	P13/SEG37	DOWN	I	Mic down input
52	P12/SEG36			
53	P11/SEG35			
54	P10/SEG34	UP	I	Mic up input
55	P07/SEG33	S33	O	LCD segment signal
56	P06/SEG32	S32	O	
57	P05/SEG31	S31	O	
58	P04/SEG30	S30	O	
59	P03/SEG29	S29	O	
60	P02/SEG28	S28	O	
61	P01/SEG27	S27	O	
62	P00/SEG26	S26	O	
63	P37/SEG25	S25	O	
64	P36/SEG24	S24	O	
65	P35/SEG23	S23	O	
66	P34/SEG22	S22	O	
67	P33/SEG21	S21	O	
68	P32/SEG20	S20	O	
69	P31/SEG19	S19	O	
70	P30/SEG18	S18	O	
71	SEG17	S17	O	
72	SEG16	S16	O	
73	SEG15	S15	O	
74	SEG14	S14	O	
75	SEG13	S13	O	
76	SEG12	S12	O	
77	SEG11	S11	O	
78	SEG10	S10	O	
79	SEG9	S9	O	
80	SEG8	S8	O	
81	SEG7	S7	O	
82	SEG6	S6	O	
83	SEG5	S5	O	
84	SEG4	S4	O	
85	SEG3	S3	O	
86	SEG2	S2	O	
87	SEG1	S1	O	
88	SEG0	S0	O	
89	VCC	VDD	-	CPU power terminal
90	VREF	Vref	-	AD converter power supply
91	AVSS	Avss	-	AD converter GND
92	COM3	COM3	O	LCD COM3 output
93	COM2	COM2	O	LCD COM2 output
94	COM1	COM1	O	LCD COM1 output
95	COM0	COM0	O	LCD COM0 output
96	VL3	VL3	-	LCD power supply
97	VL2	VL2	-	LCD power supply
98	C2	I	-	-
99	C1	C1	-	-
100	VL1	VL1	I	LCD power supply

SEMICONDUCTOR DATA

1) NJM7808FA (XA0102)

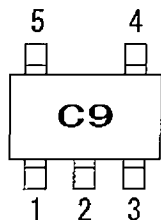
8V (1A) Voltage Regulator



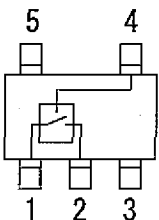
- 1. INPUT
- 2. COMMON
- 3. OUTPUT

2) TC4S66F (XA0115)

Bilateral Switch



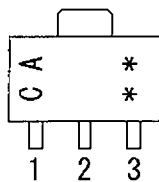
- 1. IN / OUT
- 2. OUT / IN
- 3. VSS
- 4. CONT
- 5. VDD



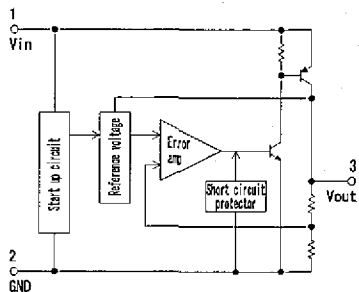
CONT	Function (IN-OUT)
L	Disconnect (Hi Z)
H	Connect (290ohm typ.)

3) AN8010M (XA0119)

10V (50mA) Voltage Regulator

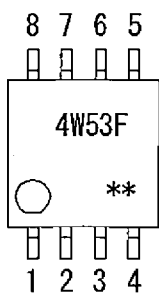


- 1. OUTPUT
- 2. COMMON
- 3. INPUT



4) TC4W53FU (XA0348)

Multiplexer / De-multiplexer



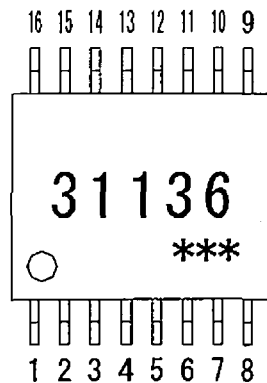
- 1. COMMON
- 2. INH
- 3. VEE
- 4. VSS
- 5. A
- 6. ch 1
- 7. ch 0
- 8. VDD

Controll input		ON channel
INH	A	
L	L	ch 0
L	H	ch 1
H	*	NONE

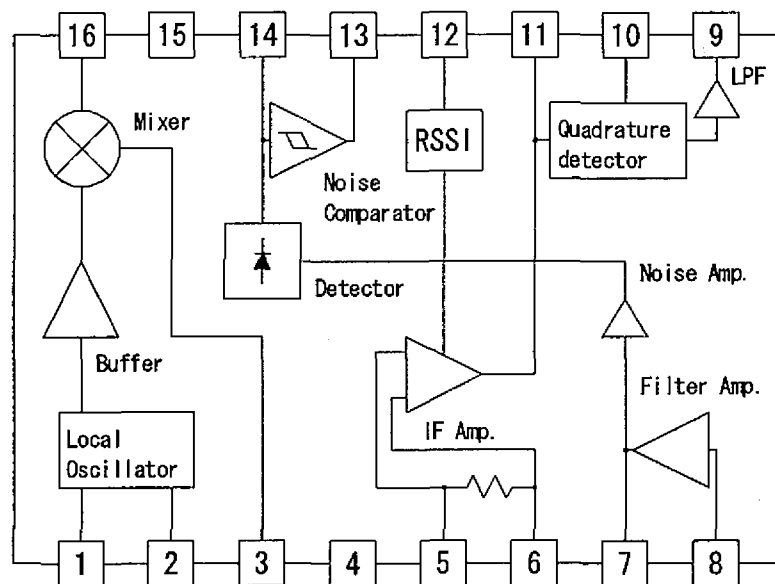
\* Don't care

## 5) TA31136FN (XA0404)

Narrow Band FM IF IC

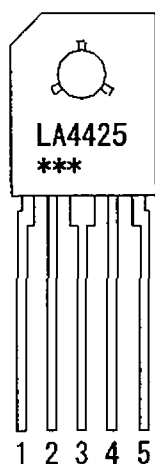


- |            |            |
|------------|------------|
| 1. OSC IN  | 9. AF OUT  |
| 2. OSC OUT | 10. QUAD   |
| 3. MIX OUT | 11. IF OUT |
| 4. Vcc     | 12. RSSI   |
| 5. IF IN   | 13. N-DET  |
| 6. DEC     | 14. N-REC  |
| 7. FIL OUT | 15. GND    |
| 8. FIL IN  | 16. MIX IN |



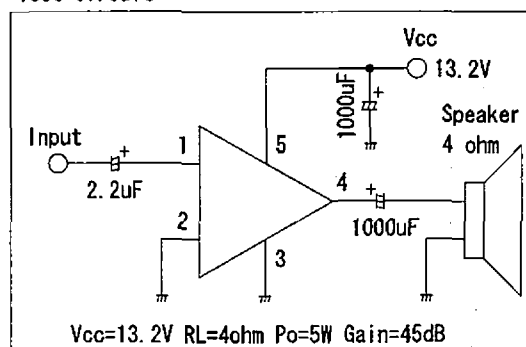
## 6) LA4425A (XA0410)

5W Audio Power Amplifier



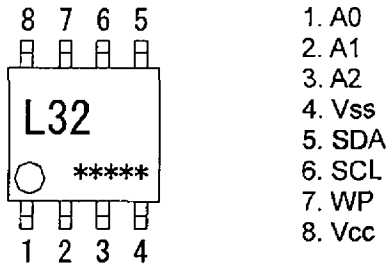
1. Input
2. Small signal GND
3. Large signal GND
4. Output
5. Vcc

Test Circuit



## 7) BR24L32FJ (XA0604Z)

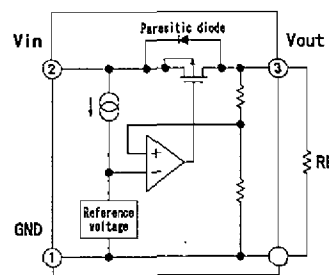
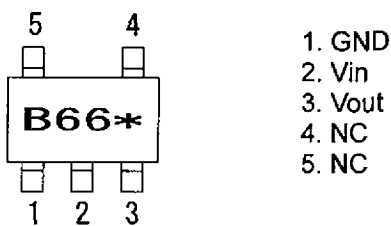
32K-Bit EEPROM



Name	Function
A0...A2	User Configurable Chip Select
Vss	Ground
SDA	Serial Address / Data / I/O
SCL	Serial Clock
WP	Write Protect Input
Vcc	+2.5 ~ 6.0V Power Supply

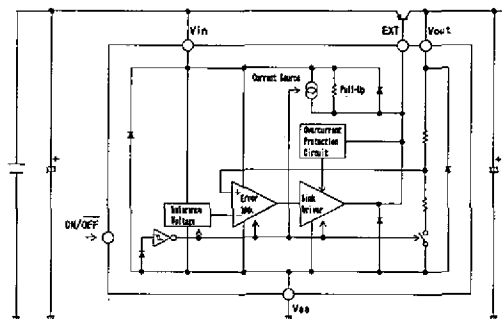
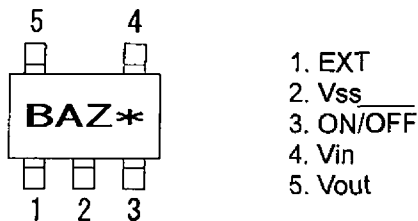
## 8) S-80845ALMP (XA0620)

4.5V Voltage Detector



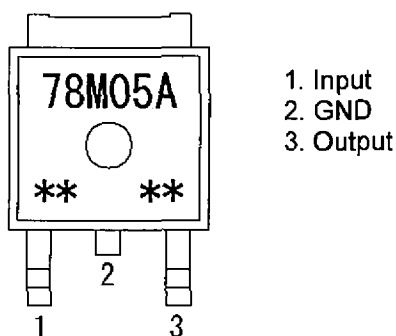
## 9) S-816A50AMC (XA0925)

External Transistor Type 5V Voltage Regulator with On/Off Function



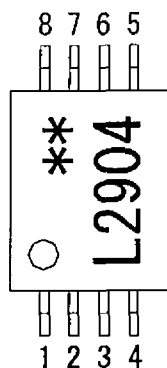
## 10) NJM78M05DL1A (XA0947)

5V (500mA) Voltage Regulator



## 11) LM2904PWR (XA1103)

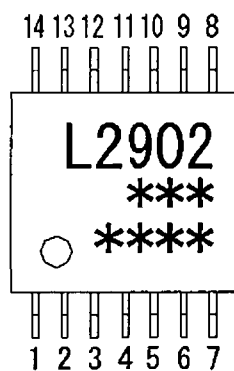
Dual Operational Amplifiers



1. Output A
2. Inverting Input A
3. Non-inverting Input A
4. GND
5. Non-inverting Input B
6. Inverting Input B
7. Output B
8. Vcc

## 12) LM2902PWR (XA1106)

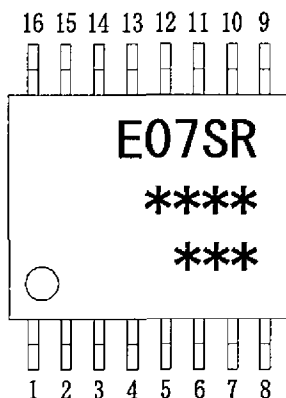
Quad Operational Amplifiers



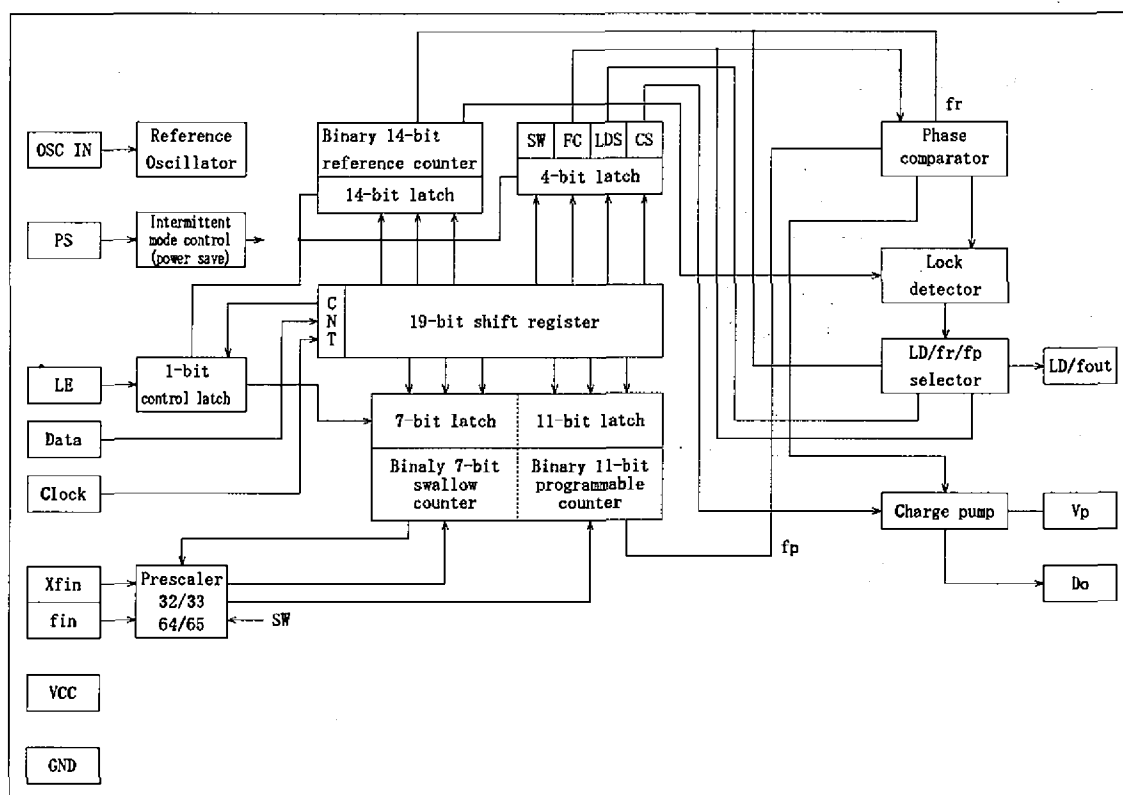
1. Output A
2. Inverting Input A
3. Non-inverting Input A
4. Vcc
5. Non-inverting Input B
6. Inverting Input B
7. Output B
8. Output C
9. Inverting Input C
10. Non-inverting Input C
11. GND
12. Non-inverting Input D
13. Inverting Input D
14. Output D

### 13) MB15E07SR (XA1107)

#### PLL Synthesizer



- |           |               |
|-----------|---------------|
| 1. OSC IN | 9. Clock      |
| 2. N. C.  | 10. Data      |
| 3. Vp     | 11. LE        |
| 4. Vcc    | 12. PS        |
| 5. Do     | 13. N. C.     |
| 6. GND    | 14. LD / fout |
| 7. Xfin   | 15. N. C.     |
| 8. fin    | 16. N. C.     |



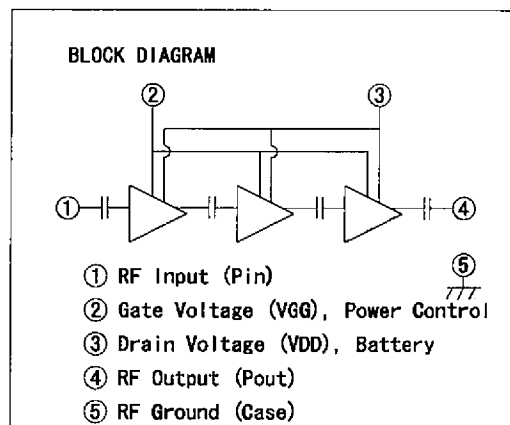
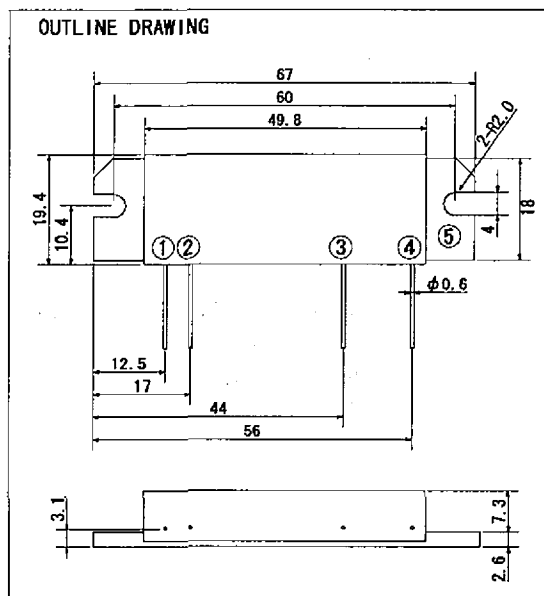
( Vcc = 2.7 to 5.0V, Ta = -40°C to +85°C )

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Power supply voltage	Vcc	-	2.7	3.75	5.0	V
Power supply current	Icc	2500MHz Vcc=Vp=3.75V		8.0		mA
LPF supply voltage	Vp	-	Vcc	-	5.5	V
Local oscillator input level	Vfin	100MHz to 300MHz 300MHz to 2500MHz	-6 -15		+2 +2	dBm
Local oscillator input frequency	fin	-	100		2500	MHz
Xin input level	Vxin	-	0.5		Vcc	Vp-p
Xin input frequency	Fxin	-	3		40	MHz



## 14) RA60H1317M1 (XA1108)

144 ~ 146MHz 60W RF Power Module



### ABSOLUTE MAXIMUM RATING ( Tc = 25 °C, unless otherwise noted )

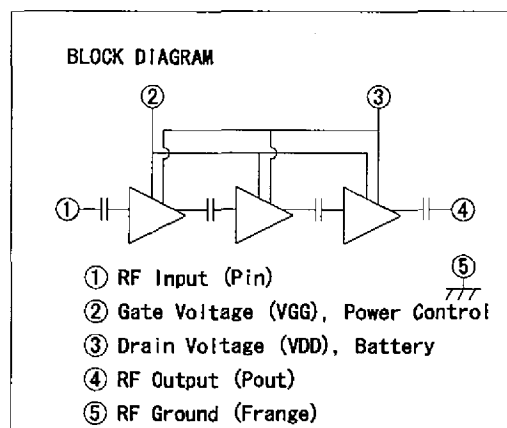
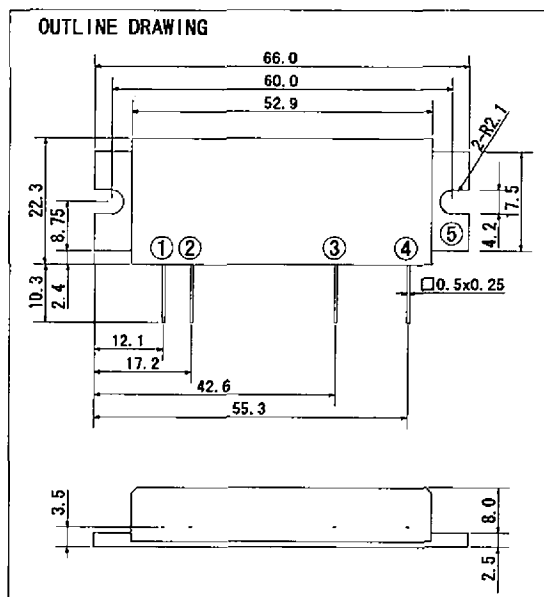
Symbol	Parameter	Conditions	Ratings	Unit
VDD	Drain Voltage	VGG < 5V, ZG = ZL = 50ohm	17	V
VGG	Gate Voltage	VDD < 12.5V, Pin=50mW	5.5	V
IDD	Drain Current	ZG = ZL = 50ohm	15	A
Pin	Input Power	f = 135 – 175 MHz, Pin=50mW	100	mW
Pout	Output Power	ZG = ZL = 50ohm	80	W
Tcase (OP)	Operation Case Temperature		-30 to +110	°C
Tstg	Storage Temperature		-40 to +110	°C

### ELECTRICAL CHARACTERISTICS ( Tc = 25 °C, unless otherwise noted )

Symbol	Parameter	Conditions	Ratings			Unit
			Min	Typ	Max	
f	Frequency Range	VDD = 12.5V VGG = 5V Pin = 50mW	135		175	MHz
Pout	Output Power		60			W
$\eta$ T	Total Efficiency		45			%
2fo	2 <sup>nd</sup> Harmonic				-50	dBc
P in	Input VSWR				3:1	-
IGG	Gate Current			1		mA
-	Stability	VDD=10.0-15.2V, Pin=25-70mW, Pout<70W (VGG control), Load VSWR=3:1	No parasitic oscillation			-
-	Load VSWR Tolerance	VDD=15.2V, Pin=50mW, Pout=60W (VGG control), Load VSWR=8:1	No degradation or destroy			-

## 15) S-AU82L (XA1142)

400 ~ 470MHz 60W RF Power Module



ABSOLUTE MAXIMUM RATING (  $T_c = 25^\circ\text{C}$ , unless otherwise noted )









































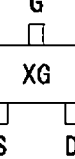
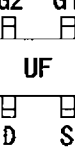

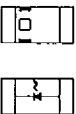

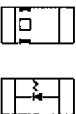

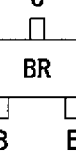
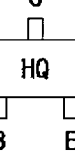
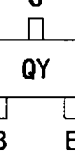
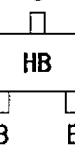
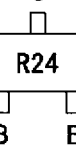

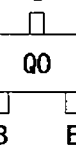

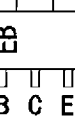
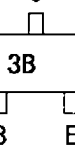





Symbol	Parameter	Conditions	Ratings	Unit
VDD	Drain Voltage	$V_{GG} < 5V$ , $P_i = 50mW$ , $P_o < 60W$	16.5	V
VGG	Gate Voltage	$V_{DD} < 12.5V$ , $P_{in}=50mW$	5.5	V
IDD	Drain Current		15	A
Pin	Input Power	$V_{DD} < 12.5V$ , $V_{GG} < 5V$	100	MW
Pout	Output Power	$12.5V < V_{DD} < 16.5V$ , $V_{GG} = 5V$ , $P_i = 50mW$	80	W
Tcase (OP)	Operation Case Temperature		-30 to +100	$^\circ\text{C}$
Tstg	Storage Temperature		-40 to +100	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS (  $T_c = 25^\circ\text{C}$ , unless otherwise noted )

Symbol	Parameter	Conditions	Ratings			Unit
			Min	Typ	Max	
f	Frequency Range	$V_{DD} = 12.5V$ $V_{GG} = 5V$ $P_{in} = 50mW$ $Z_L = 50\Omega$	400		470	MHz
Pout	Output Power		60			W
$\eta_T$	Total Efficiency		40			%
2fo	2 <sup>nd</sup> Harmonic				-30	dBc
P in	Input VSWR				3.0	-
IGG	Gate Current			1		mA
-	Stability	$V_{DD}=10.5-16.5V$ , $V_{GG}=0-5V$ , $P_{in}=50mW$ , $P_{out}<60W$ (VGG control), Load VSWR=3:1 ALL PHASE	All spurious output than 60dB below desired signal			-
-	Load VSWR Tolerance	$V_{DD}=10.5-16.5V$ , $V_{GG}=0-5V$ , $P_{in}=50mW$ , $P_{out}=60W$ (VGG control), Load VSWR=20:1 ALL PHASE	No degradation			

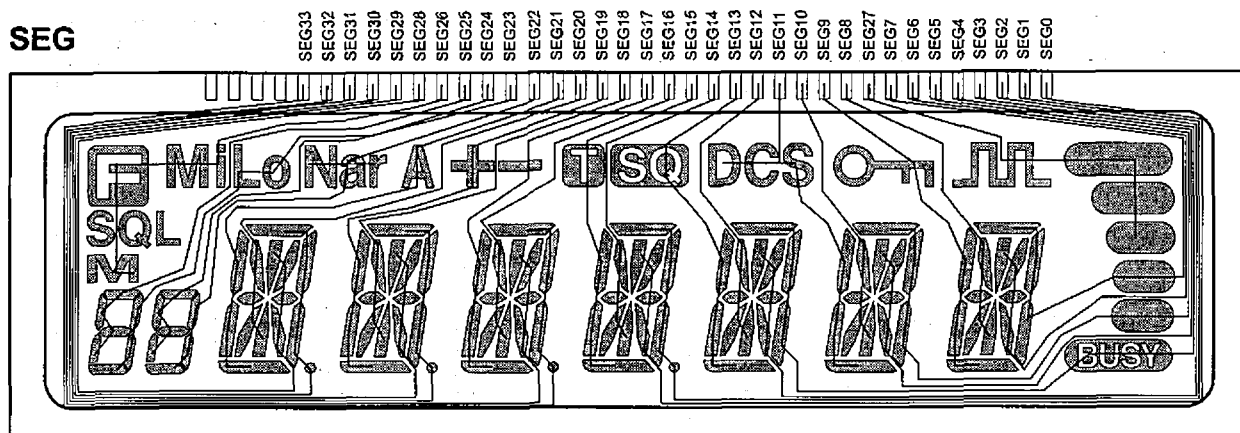
## 16) Transistor, Diode and LED Outline Drawing

Top View

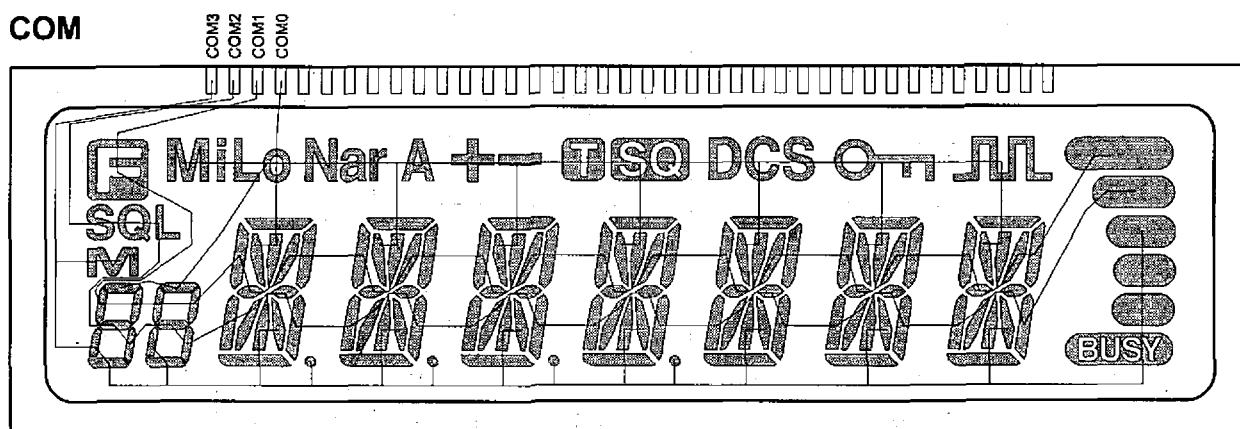
MI407 XD0013	DA204U XD0130	1SV215 XD0132	1SV237 XD0141	MA728 XD0234	1SS355 XD0254	1SV268 XD0301
 	 	 	 	 	 	 
DAN235E XD0320	MA2S111 XD0323	1SS390 XD0342	RLS-73 XD0363	1SV278 XD0374	MA4S713 XD0375	1SV282 XD0376
 	 	 	 	 	 	 
MAZS0270H XD0377	CRG01 XD0391	UDZS5. 6B XD0395	DAN222M XD0400	VDZ5. 1B XD0402	S3V60 XD0414	2SK880GR XE0021
 	 	 	 	 	 	
3SK293 XE0053	2SK2539 XE0066	FA1111C XL0069	FA1111C XL0077	2SC4081 XT0095	2SA1036K XT0110	2SC4215Y XT0124
		 	 			
2SC4245Y XT0125	2SC4226 XT0141	2SB766A XT0170	2SC4915 XT0178	2SB1386 XT0190	2SC5551 XT0194	2SD2620J XT0208
						
XP1215 XU0178	RN1104 XU0195	EMD6 XU0209	RN1107FV XU0210	RN2107FV XU0211		
						
Rb=10kohm Rbe=none	Rb=47kohm Rbe=47kohm	Rb=4. 7kohm Rbe=none	Rb=10kohm Rbe=47kohm	Rb=10kohm Rbe=47kohm		

## 17) LCD Connection (TTR3626UPFDHN)

SEG

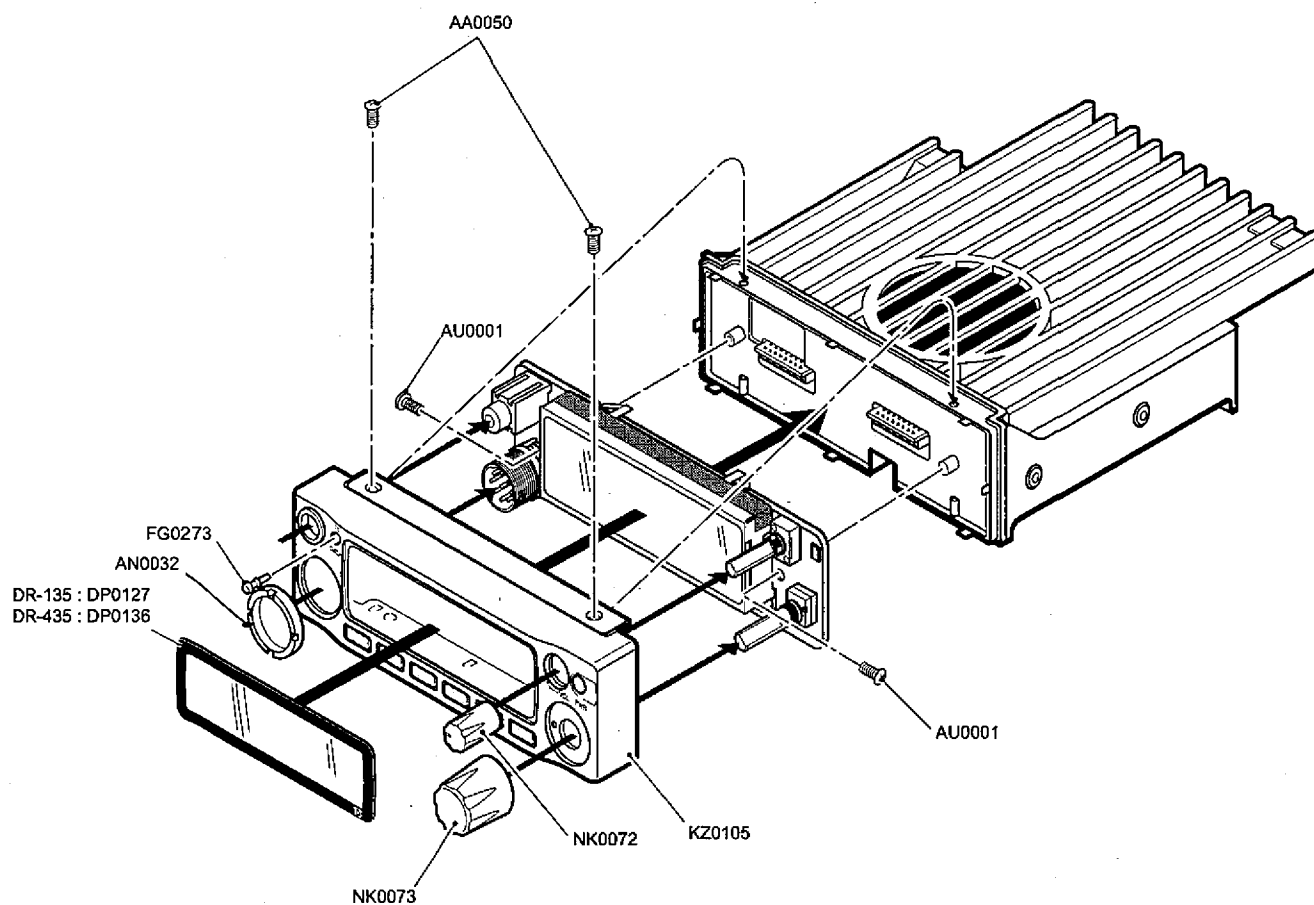


COM

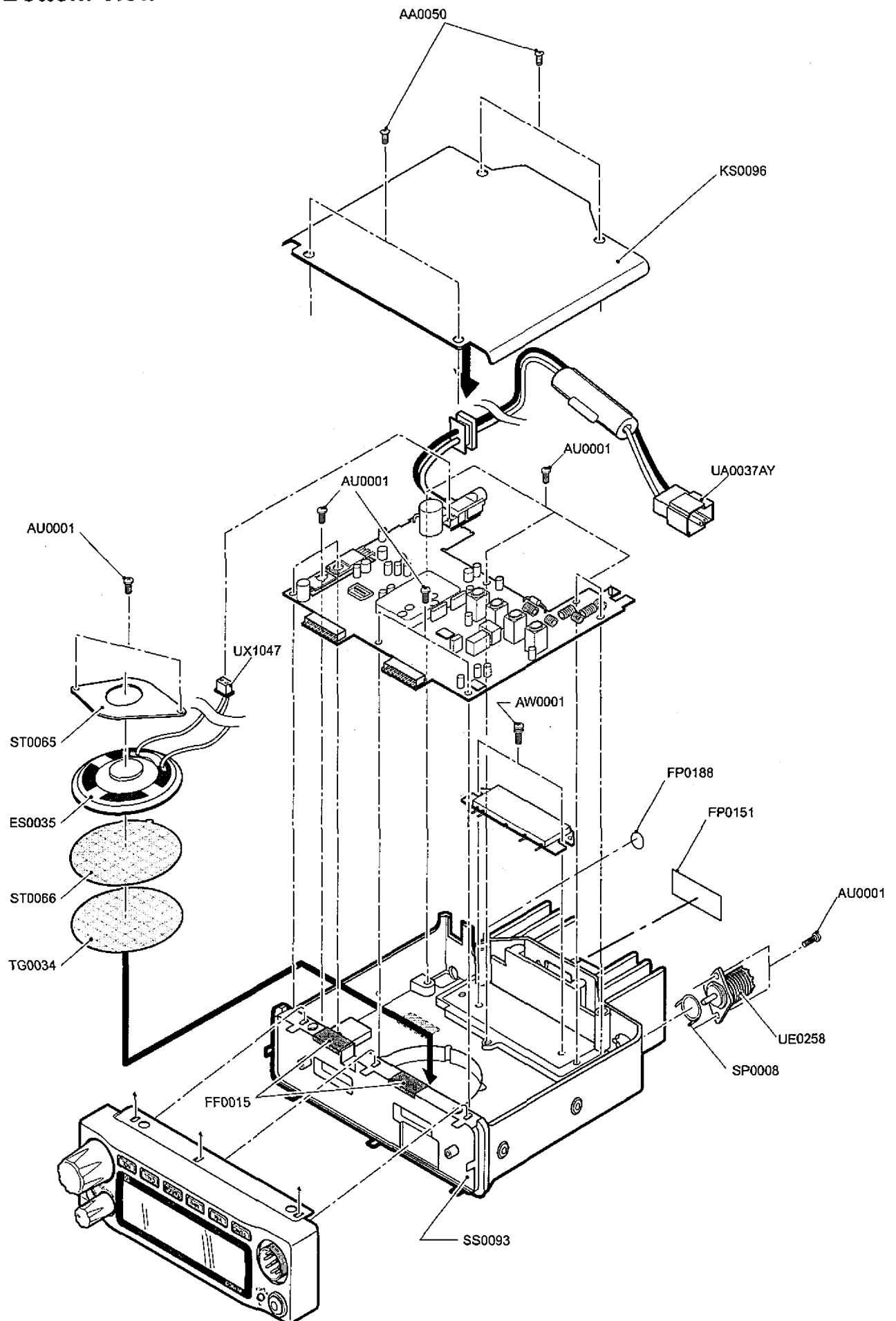


# EXPLODED VIEW

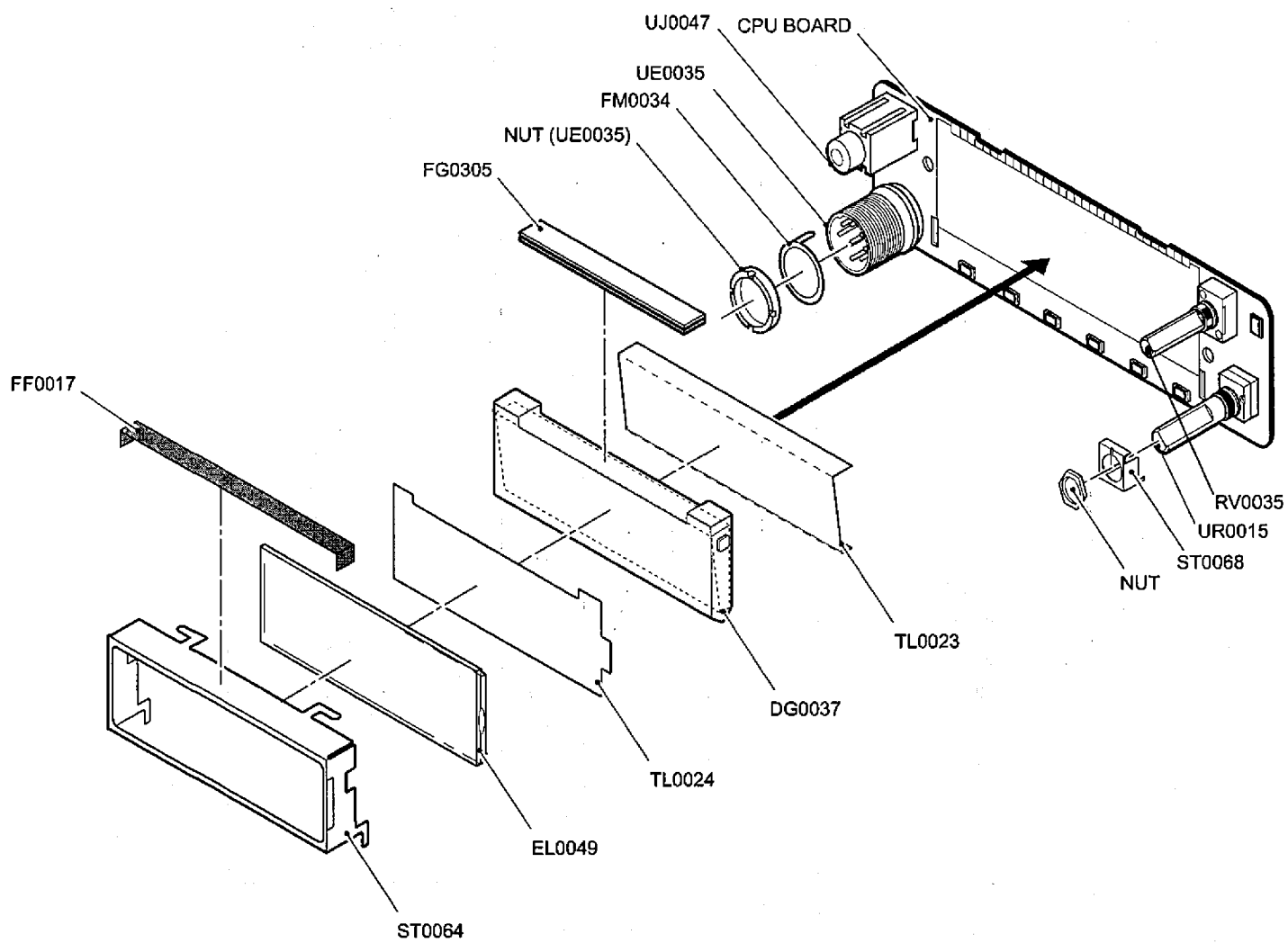
## 1) Top and Front View



## 2) Bottom View



### 3) LCD Assembly



# PARTS LIST

## CPU Unit

Ref No.	Part No.	Description	Parts Name	Qty.		Ver.
				DR-135	DR-435	
C1	CU3554	Chip C.	GRM155B11A104KA01D	1	1	
C2	CU3554	Chip C.	GRM155B11A104KA01D	1	1	
C3	CU3549	Chip C.	GRM155B11C153KA01D	1	1	
C4	CU3549	Chip C.	GRM155B11C153KA01D	1	1	
C5	CU3554	Chip C.	GRM155B11A104KA01D	1	1	
C6	CU3523	Chip C.	GRM1552C1H101JD01D	1	1	
C7	CU3523	Chip C.	GRM1552C1H101JD01D	1	1	
C8	CU3543	Chip C.	GRM155B11E472KA01D	1	1	
C9	CU3554	Chip C.	GRM155B11A104KA01D	1	1	
C10	CU3543	Chip C.	GRM155B11E472KA01D	1	1	
C11	CU3543	Chip C.	GRM155B11E472KA01D	1	1	
C12	CU3553	Chip C.	GRM155B11A473KA01D	1	1	
C13	CS0049	Chip tantalum	TMCSA1C105MTRF	1	1	
C14	CU3514	Chip C.	GRM1552C1H180JZ01D	1	1	
C15	CU3514	Chip C.	GRM1552C1H180JZ01D	1	1	
C16	CU3535	Chip C.	GRM155B11H102KA01D	1	1	
C17	CS0424	Chip tantalum	TMCSA1C106MTR	1	1	
C18	CU3535	Chip C.	GRM155B11H102KA01D	1	1	
C19	CU3554	Chip C.	GRM155B11A104KA01D	1	1	
C20	CU3547	Chip C.	GRM155B11C103KA01D	1	1	
C21	CU3547	Chip C.	GRM155B11C103KA01D	1	1	
C22	CU3535	Chip C.	GRM155B11H102KA01D	1	1	
C23	CU3547	Chip C.	GRM155B11C103KA01D	1	1	
C24	CU3535	Chip C.	GRM155B11H102KA01D	1	1	
C25	CU3535	Chip C.	GRM155B11H102KA01D	1	1	
C26	CU3535	Chip C.	GRM155B11H102KA01D	1	1	
C27	CU3535	Chip C.	GRM155B11H102KA01D	1	1	
CN1	UE0291	Connector	17R-JE(LF)(SN)	1	1	
CN2	UE0291	Connector	17R-JE(LF)(SN)	1	1	
CN3	UE0035	Mic Connector	MIC FM214-8SMPY	1	1	
D1	XL0069	Chip LED	FA1111C-TR	1	1	
D2	XL0077	Chip LED	FA1111C-732-TR	1	1	
D3	XL0077	Chip LED	FA1111C-732-TR	1	1	
D4	XL0069	Chip LED	FA1111C-TR	1	1	
D5	XL0077	Chip LED	FA1111C-732-TR	1	1	
D6	XL0077	Chip LED	FA1111C-732-TR	1	1	
D8	XD0323	Chip Diode	MA2S11100L	1	1	
D9	XD0234	Chip Diode	MA2J72800L	1	1	
D11	XL0077	Chip LED	FA1111C-732-TR	1	1	
D17	XD0234	Chip Diode	MA2J72800L	1	1	
IC1	XA1130	CPU	CPU DR135MK3	1	1	
IC2	XA0604Z	IC	BR24132FJ-WE2	1	1	
IC4	XA0620	IC	S80845CLMC-866-T2G	1	1	
IC6	XA0348	TC4W53FU	TC4W53FU(TE12L)	1	1	
JK1	UJ0047	Jack	HSJ2013-01-120	1	1	
JP3	MACL04G	Wire	#30AH1-040-H1	1	1	
LCD1	EL0049	LCD	TTR3626 UPTDHN	1	1	
Q4	XU0210	Chip	RN1107MFV(TPL3)	1	1	
Q6	XT0095	Chip	2SC4081 T108R	1	1	
Q7	XT0170	Chip	2SB0766ARL	1	1	
Q8	XU0210	Chip	RN1107MFV(TPL3)	1	1	
Q10	XU0210	Chip	RN1107MFV(TPL3)	1	1	
Q11	XU0211	Chip	RN2107FV (TPL3)	1	1	
Q12	XU0211	Chip	RN2107FV (TPL3)	1	1	
R1	RK3554	Chip R.	ERJ2GEJ223X	1	1	
R4	RK3554	Chip R.	ERJ2GEJ223X	1	1	
R5	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R6	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R7	RK3026	Chip R.	MCR03EZPJ101	1	1	
R8	RK3026	Chip R.	MCR03EZPJ101	1	1	
R10	RK3032	Chip R.	MCR03EZPJ331	1	1	
R11	RK3548	Chip R.	ERJ2GEJ472X	1	1	
R13	RK3001	Chip R.	MCR03EZPJ000	1	1	
R14	RK3548	Chip R.	ERJ2GEJ682X	1	1	
R15	RK3501	Chip R.	ERJ2GE0R00X	1	1	
R16	RK3001	Chip R.	MCR03EZPJ000	1	1	
R19	RK3562	Chip R.	ERJ2GEJ104X	1	1	
R20	RK3546	Chip R.	ERJ2GEJ472X	1	1	
R22	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R25	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R26	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R27	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R28	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R29	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R30	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R32	RK3544	Chip R.	ERJ2GEJ332X	1	1	
R33	RK3534	Chip R.	ERJ2GEJ471X	1	1	
R34	RK3547	Chip R.	ERJ2GEJ562X	1	1	
R35	RK3552	Chip R.	ERJ2GEJ153X	1	1	
R36	RK3562	Chip R.	ERJ2GEJ104X	1	1	
R37	RK3549	Chip R.	ERJ2GEJ822X	1	1	
R38	RK3551	Chip R.	ERJ2GEJ123X	1	1	
R39	RK3558	Chip R.	ERJ2GEJ473X	1	1	
R40	RK3562	Chip R.	ERJ2GEJ104X	1	1	
R41	RK3526	Chip R.	ERJ2GEJ101X	1	1	
R42	RK3550	Chip R.	ERJ2GEJ103X	1	1	

FXE

FXE

FX

Ref No.	Part No.	Description	Parts Name	Qty.		Ver.
				DR-135	DR-435	
R43	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R44	RK3026	Chip R.	MCR03EZPJ101	1	1	
R45	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R48	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R50	RK3570	Chip R.	ERJ2GEJ474X	1	1	
R51	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R52	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R53	RK3562	Chip R.	ERJ2GEJ104X	1	1	
R54	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R55	RK3574	Chip R.	ERJ2GEJ105X	1	1	
R56	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R57	RK3566	Chip R.	ERJ2GEJ224X	1	1	
R58	RK3534	Chip R.	ERJ2GEJ471X	1	1	
R59	RK3526	Chip R.	ERJ2GEJ101X	1	1	
R60	RK3034	Chip R.	MCR03EZPJ471	1	1	
R61	RK3574	Chip R.	ERJ2GEJ105X	1	1	
R62	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R63	RK3526	Chip R.	ERJ2GEJ101X	1	1	
R64	RK3549	Chip R.	ERJ2GEJ822X	1	1	
R65	RK3526	Chip R.	ERJ2GEJ101X	1	1	
R66	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R67	RK3526	Chip R.	ERJ2GEJ101X	1	1	
R68	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R70	RK3562	Chip R.	ERJ2GEJ104X	1	1	
R71	RK3574	Chip R.	ERJ2GEJ105X	1	1	
R72	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R73	RK3032	Chip R.	MCR03EZPJ331	1	1	
R74	RK3526	Chip R.	ERJ2GEJ101X	1	1	
R76	RK3532	Chip R.	ERJ2GEJ331X	1	1	
R79	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R80	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R83	RK3538	Chip R.	ERJ2GEJ102X	1	1	
R85	RK3546	Chip R.	ERJ2GEJ472X	1	1	
R87	RK3554	Chip R.	ERJ2GEJ223X	1	1	
R88	RK3550	Chip R.	ERJ2GEJ103X	1	1	
R89	RK3558	Chip R.	ERJ2GEJ473X	1	1	
R90	RK3558	Chip R.	ERJ2GEJ473X	1	1	
R98	RK3501	Chip R.	ERJ2GE0R00X	1	1	
RE1	UR0015	Dial	RH90N74E20-A90770	1	1	
SW1	UU0015Z	Switch	EVQPPPA25	1	0	
SW1	UU0042	Switch	SKQYAAE010	0	1	
SW2	UU0015Z	Switch	EVQPPPA25	1	0	
SW2	UU0042	Switch	SKQYAAE010	0	1	
SW3	UU0015Z	Switch	EVQPPPA25	1	0	
SW3	UU0042	Switch	SKQYAAE010	0	1	
SW4	UU0015Z	Switch	EVQPPPA25	1	0	
SW4	UU0042	Switch	SKQYAAE010	0	1	
SW5	UU0015Z	Switch	EVQPPPA25	1	0	
SW5	UU0042	Switch	SKQYAAE010	0	1	
SW6	UU0015Z	Switch	EVQPPPA25	1	0	
SW6	UU0042	Switch	SKQYAAE010	0	1	
SW7	UU0015Z	Switch	EVQPPPA25	1	0	
SW7	UU0042	Switch	SKQYAAE010	0	1	
VR1	RV0035	Variable R.	EVUF2JFK4814	1	1	
X1	XQ0131	Xtal	CSA310 3.6864MHZ	1	1	
	DG0037		LCD LIGHT DR135	1	1	
	FG0305		LCD RUB.CONNECT.	1	1	
	FM0034		MIC GND PLATE	1	1	
	FP0034		MIC SPACER DR110	1	1	
	FP0234		MIC SPACER A DR135	1	1	
	ST0064		LCD HOLDER DR135	1	1	
	ST0068		DIAL FITTING DR135	1	1	
	TL0023		REFLECTION DR135	1	1	
	TL0024		DIFFUSION SHEET 135	1	1	
	YZ0042		CEMENT G17 / 1G	1	1	

## MAIN Unit DR-135

Ref No.	Part No.	Description	Parts Name	Qty.		Ver.
				DR-135	DR-435	
C104	CU3047	Chip C.	C1608JB1H103KT-NS	1	1	
C105	CS0394	Chip tantalum	TMCM80J476MTRF	1	1	
C107	CU3554	Chip C.	GRM155B11A104KA01D	1	1	
C108	CU3547	Chip C.	GRM155B11C103KA01D	1	1	
C109	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	1	
C111	CU3554	Chip C.	GRM155B11A104KA01D	1	1	
C112	CU3554	Chip C.	GRM155B11A104KA01D	1	1	
C113	CU3047	Chip C.	C1608JB1H103KT-NS	1	1	
C114	CU3547	Chip C.	GRM155B11C103KA01D	1	1	
C116	CU3019	Chip C.	C1608CH1H470JT-NS	1	1	
C117	CU3547	Chip C.	GRM155B11C103KA01D	1	1	
C120	CU3522	Chip C.	GRM1552C1H820JD01D	1	1	
C121	CU3503	Chip C.	GRM1554C1H2R0CZ01D	1	1	
C122	CU3502	Chip C.	GRM1554C1H1R0CZ01D	1	1	
C123	CU3515	Chip C.	GRM1552C1H220JZ01D	1	1	



Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
C130	CU0108	Chip C.	LMK212BJ105KG-T	1	
C131	CU3535	Chip C.	GRM155B11H102KA01D	1	
C132	CU3535	Chip C.	GRM155B11H102KA01D	1	
C133	CU3503	Chip C.	GRM1554C1H2R0CZ01D	1	
C135	CU3547	Chip C.	GRM155B11C103KA01D	1	
C136	CU3011	Chip C.	C1608CH1H100DT-NS	1	
C137	CU3517	Chip C.	GRM1552C1H330JZ01D	1	
C139	CU3517	Chip C.	GRM1552C1H330JZ01D	1	
C140	CU3517	Chip C.	GRM1552C1H330JZ01D	1	
C143	CU3554	Chip C.	GRM155B11A104KA01D	1	
C144	CU3547	Chip C.	GRM155B11C103KA01D	1	
C145	CU3503	Chip C.	GRM1554C1H2R0CZ01D	1	
C146	CE0364	Electrolytic C.	16ME47SWB+TS	1	
C148	CU3517	Chip C.	GRM1552C1H330JZ01D	1	
C149	CU3517	Chip C.	GRM1552C1H330JZ01D	1	
C151	CU3547	Chip C.	GRM155B11C103KA01D	1	
C152	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C153	CU3535	Chip C.	GRM155B11H102KA01D	1	
C154	CU3535	Chip C.	GRM155B11H102KA01D	1	
C155	CU3506	Chip C.	GRM1552C1H5R0CZ01D	1	
C157	CU3535	Chip C.	GRM155B11H102KA01D	1	
C158	CU3535	Chip C.	GRM155B11H102KA01D	1	
C159	CU3535	Chip C.	GRM155B11H102KA01D	1	
C163	CU3535	Chip C.	GRM155B11H102KA01D	1	
C164	CU3535	Chip C.	GRM155B11H102KA01D	1	
C165	CU3559	Chip C.	GRM155B30J105KE18D	1	
C166	CE0420	Electrolytic C.	16ME22SZ	1	
C169	CU3527	Chip C.	GRM1552C1E221JD01D	1	
C170	CU3554	Chip C.	GRM155B11A104KA01D	1	
C171	CU3515	Chip C.	GRM1552C1H220JZ01D	1	
C173	CU3535	Chip C.	GRM155B11H102KA01D	1	
C174	CU3527	Chip C.	GRM1552C1E221JD01D	1	
C175	CU3535	Chip C.	GRM155B11H102KA01D	1	
C178	CU3554	Chip C.	GRM155B11A104KA01D	1	
C179	CU3554	Chip C.	GRM155B11A104KA01D	1	
C180	CU3535	Chip C.	GRM155B11H102KA01D	1	
C183	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C185	CS0232	Chip tantalum	TMCA1V474MTRF	1	
C186	CU3511	Chip C.	GRM1552C1H100JZ01D	1	
C187	CU3535	Chip C.	GRM155B11H102KA01D	1	
C188	CU3535	Chip C.	GRM155B11H102KA01D	1	
C189	CU3019	Chip C.	C1608CH1H470JT-NS	1	
C190	CU3547	Chip C.	GRM155B11C103KA01D	1	
C191	CU3552	Chip C.	GRM155B11A333KA01D	1	
C193	CU4033	Chip C.	GRM31BR72J102KW01L	1	
C194	CU3019	Chip C.	C1608CH1H470JT-NS	1	
C195	CU3015	Chip C.	C1608CH1H220JT-NS	1	
C196	CU3516	Chip C.	GRM1552C1H270JZ01D	1	
C199	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C200	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C201	CU4013	Chip C.	GRM42-6CH150J500PT	1	
C202	CU4016	Chip C.	GRM42-6CH270J500PT	1	
C203	CU4018	Chip C.	GRM42-6CH270J500PT	1	
C204	CU4011	Chip C.	GRM42-6CH100D500PT	1	
C205	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C206	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C207	CU3064	Chip C.	C1608CH1H1R5CT-NS	1	
C208	CU3064	Chip C.	C1608CH1H1R5CT-NS	1	
C209	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C210	CU3011	Chip C.	C1608CH1H100DT-NS	1	
C211	CU3011	Chip C.	C1608CH1H100DT-NS	1	
C212	CE0364	Electrolytic C.	16ME47SWB+TS	1	
C213	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C215	CU4015	Chip C.	GRM42-6CH220J500PT	1	
C216	CU4015	Chip C.	GRM42-6CH220J500PT	1	
C217	CU3551	Chip C.	GRM155B11C223KA01D	1	
C218	CU3551	Chip C.	GRM155B11C223KA01D	1	
C219	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C220	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C222	CU3535	Chip C.	GRM155B11H102KA01D	1	
C223	CE0364	Electrolytic C.	16ME47SWB+TS	1	
C224	CU3023	Chip C.	C1608CH1H101JT-NS	1	
C225	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C226	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C227	CU0108	Chip C.	LMK212BJ105KG-T	1	
C228	CU3535	Chip C.	GRM155B11H102KA01D	1	
C229	CU3553	Chip C.	GRM155B11A473KA01D	1	
C230	CU3535	Chip C.	GRM155B11H102KA01D	1	
C231	CU3535	Chip C.	GRM155B11H102KA01D	1	
C232	CU3535	Chip C.	GRM155B11H102KA01D	1	
C233	CU3535	Chip C.	GRM155B11H102KA01D	1	
C235	CU3504	Chip C.	GRM1553C1H3R0CZ01D	1	
C237	CU3535	Chip C.	GRM155B11H102KA01D	1	
C238	CU3111	Chip C.	C1608JB1E104KT-NS	1	
C239	CU3535	Chip C.	GRM155B11H102KA01D	1	
C241	CU3522	Chip C.	GRM1552C1H620JD01D	1	
C242	CU3551	Chip C.	GRM155B11C223KA01D	1	
C243	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C244	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C245	CU0108	Chip C.	LMK212BJ105KG-T	1	
C248	CU3543	Chip C.	GRM155B11E472KA01D	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
C248	CU3547	Chip C.	GRM155B11C103KA01D	1	
C249	CU3538	Chip C.	GRM155B11H182KA01D	1	
C250	CU3526	Chip C.	GRM1552C1E181JD01D	1	
C252	CU3535	Chip C.	GRM155B11H102KA01D	1	
C253	CU3549	Chip C.	GRM155B11C153KA01D	1	
C254	CU3111	Chip C.	C1608JB1E104KT-NS	1	
C255	CE0364	Electrolytic C.	16ME47SWB+TS	1	
C256	CU3111	Chip C.	C1608JB1E104KT-NS	1	
C257	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C258	CU0108	Chip C.	LMK212BJ105KG-T	1	
C260	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C261	CU3535	Chip C.	GRM155B11H102KA01D	1	
C262	CU3535	Chip C.	GRM155B11H102KA01D	1	
C263	CS0424	Chip tantalum	TMCA1C108MTRF	1	
C264	CU3519	Chip C.	GRM1552C1H470JZ01D	1	
C265	CU3535	Chip C.	GRM155B11H102KA01D	1	
C266	CU3503	Chip C.	GRM1554C1H2R0CZ01D	1	
C267	CU3535	Chip C.	GRM155B11H102KA01D	1	
C268	CU3535	Chip C.	GRM155B11H102KA01D	1	
C269	CU3535	Chip C.	GRM155B11H102KA01D	1	
C270	CU3047	Chip C.	C1608JB1H103KT-NS	1	
C271	CU3535	Chip C.	GRM155B11H102KA01D	1	
C272	CS0220	Chip tantalum	TMCA1C225MTRF	1	
C273	CS0220	Chip tantalum	TMCA1C225MTRF	1	
C274	CU3535	Chip C.	GRM155B11H102KA01D	1	
C275	CU3547	Chip C.	GRM155B11C103KA01D	1	
C276	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C277	CE0343	Electrolytic C.	16ME1000HC+T	1	
C278	CU3535	Chip C.	GRM155B11H102KA01D	1	
C279	CU3551	Chip C.	GRM155B11C223KA01D	1	
C281	CU3512	Chip C.	GRM1552C1H120JZ01D	1	
C282	CU3502	Chip C.	GRM1554C1H1R0CZ01D	1	
C283	CU3531	Chip C.	GRM155B11H471KA01D	1	
C284	CU3502	Chip C.	GRM1554C1H1R0CZ01D	1	
C285	CU3535	Chip C.	GRM155B11H102KA01D	1	
C286	CU3027	Chip C.	C1608CH1H221JT-NS	1	
C287	CS0063	Chip tantalum	TMCA1V104MTRF	1	
C288	CU3511	Chip C.	GRM1552C1H100JZ01D	1	
C289	CU3535	Chip C.	GRM155B11H102KA01D	1	
C290	CU3535	Chip C.	GRM155B11H102KA01D	1	
C293	CU3535	Chip C.	GRM155B11H102KA01D	1	
C294	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C295	CU3551	Chip C.	GRM155B11C223KA01D	1	
C296	CU3511	Chip C.	GRM1552C1H100JZ01D	1	
C297	CU3535	Chip C.	GRM155B11H102KA01D	1	
C299	CU3547	Chip C.	GRM155B11C103KA01D	1	
C300	CU3515	Chip C.	GRM1552C1H220JZ01D	1	
C301	CU3523	Chip C.	GRM1552C1H101JD01D	1	
C302	CU3523	Chip C.	GRM1552C1H101JD01D	1	
C303	CU3523	Chip C.	GRM1552C1H101JD01D	1	
C304	CU3535	Chip C.	GRM155B11H102KA01D	1	
C305	CU3547	Chip C.	GRM155B11C103KA01D	1	
C306	CU3554	Chip C.	GRM155B11A104KA01D	1	
C307	CU3547	Chip C.	GRM155B11C103KA01D	1	
C308	CE0342	Electrolytic C.	16ME470HC+TS	1	
C309	CU3551	Chip C.	GRM155B11C223KA01D	1	
C310	CU3523	Chip C.	GRM1552C1H101JD01D	1	
C312	CU3511	Chip C.	GRM1552C1H100JZ01D	1	
C313	CU3535	Chip C.	GRM155B11H102KA01D	1	
C321	CS0220	Chip tantalum	TMCA1C225MTRF	1	
C322	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C328	CU0108	Chip C.	LMK212BJ105KG-T	1	
C331	CU3547	Chip C.	GRM155B11C103KA01D	1	
C332	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C333	CU3535	Chip C.	GRM155B11H102KA01D	1	
C401	CU3549	Chip C.	GRM155B11C153KA01D	1	
C402	CU3550	Chip C.	GRM155B11C183KA01D	1	
C403	CU3552	Chip C.	GRM155B11A333KA01D	1	
C404	CU3559	Chip C.	GRM155B30J105KE18D	1	
C405	CU3542	Chip C.	GRM155B11H392KA01D	1	
C406	CU3545	Chip C.	GRM155B11E882KA01D	1	
C407	CU3541	Chip C.	GRM155B11H332KA01D	1	
C408	CU3544	Chip C.	GRM155B11E562KA01D	1	
C409	CU3535	Chip C.	GRM155B11H102KA01D	1	
C410	CU3539	Chip C.	GRM155B11H222KA01D	1	
C412	CU0108	Chip C.	LMK212BJ105KG-T	1	
C413	CU3541	Chip C.	GRM155B11H332KA01D	1	
C414	CU3542	Chip C.	GRM155B11H392KA01D	1	
C415	CU3545	Chip C.	GRM155B11E682KA01D	1	
C417	CU3547	Chip C.	GRM155B11C103KA01D	1	
C418	CU3547	Chip C.	GRM155B11C103KA01D	1	
C419	CU3547	Chip C.	GRM155B11C103KA01D	1	
C427	CU3559	Chip C.	GRM155B30J105KE18D	1	
C428	CU0110	Chip C.	C2012JB1A475KT-NS	1	
C601	CU3515	Chip C.	GRM1552C1H220JZ01D	1	
C607	CU3511	Chip C.	GRM1552C1H100JZ01D	1	
C611	CU0108	Chip C.	LMK212BJ105KG-T	1	
C613	CU3515	Chip C.	GRM1552C1H220JZ01D	1	
CN101	UE0369	Connector	AXN49301616	1	
CN102	UE0293	Connector	17PS-JE	1	
CN103	UE0293	Connector	17PS-JE	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
CN104	UA0037AY	Wire	R-82.0X0.2M PLUG 15A	1	
CN106	UE0043	Connector	P122A02M	1	
D102	XD0132	Chip Diode	1SV215(TPH2,F)	1	
D103	XD0132	Chip Diode	1SV215(TPH2,F)	1	
D104	XD0132	Chip Diode	1SV215(TPH2,F)	1	
D105	XD0132	Chip Diode	1SV215(TPH2,F)	1	
D106	XD0402	Chip Diode	VDZT2R 5.1B	1	
D108	XD0130	Chip Diode	DA204U T106	1	
D109	XD0301	Chip Diode	1SV268-TD-E	1	
D110	XD0013	Diode	L407CDB	1	
D111	XD0375	Chip Diode	MA4Z71300L	1	
D112	XD0375	Chip Diode	MA4Z71300L	1	
D113	XD0323	Chip Diode	MA2S11100L	1	
D114	XD0141	Chip Diode	1SV237(T85L,F)	1	
D115	XD0320	Chip Diode	DAN235E-TL	1	
D116	XD0320	Chip Diode	DAN235E-TL	1	
D118	XD0130	Chip Diode	DA204U T106	1	
D119	XD0323	Chip Diode	MA2S11100L	1	
D120	XD0374	Chip Diode	1SV278(TPH2,F)	1	
D121	XD0414	Diode	SV360-5000	1	
D122	XD0376	Chip Diode	1SV282(TPH2,F)	1	
D123	XD0376	Chip Diode	1SV282(TPH2,F)	1	
D125	XD0342	Chip Diode	1SS390 TE61	1	
D130	XD0323	Chip Diode	MA2S11100L	1	
D136	XD0395	Chip Diode	UDZS TE-17 5.6B	1	
D402	XD0323	Chip Diode	MA2S11100L	1	
D601	XD0131	Chip Diode	1SV214(TPH4,F)	1	
FL101	XC0070	Ceramic Filter	ALFYM450E-K	1	
FL102	XC0052	Ceramic Filter	ALFYM450G-K	1	
IC101	XA0947	IC	NJM78M05DL1ATE1#ZZ	1	
IC104	XA1106	IC	LM2902PWR	1	
IC108	XA0404	IC	TA31136FNG(EL)	1	
IC109	XA0115	IC	TC4S66F(T85R,F)	1	
IC110	XA1108	IC	RA60H1317M1-101	1	
IC111	XA0115	IC	TC4S66F(T85R,F)	1	
IC113	XA0115	IC	TC4S66F(T85R,F)	1	
IC114	XA1106	IC	LM2902PWR	1	
IC115	XA0102	IC	NJM7808FA-#ZZZB	1	
IC116	XA1107	IC	MB15E07SRPFTGBNDE	1	
IC117	XA0410	IC	LA4425A-E	1	
IC120	XA1103	IC	LM2904PWR	1	
IC601	XA1135	IC	74LV1GW04ASCE-E	1	
JK102	UJ0024Z	Jack	LGY6501-0900FC	1	
L101	QC0043	Chip Inductor	NLV32T-2R2J-PFS	1	
L102	QA0112	Coil	#V666SNS-063DAQ	1	
L103	QA0112	Coil	#V666SNS-063DAQ	1	
L104	QA0112	Coil	#V666SNS-063DAQ	1	
L105	QA0112	Coil	#V666SNS-063DAQ	1	
L111	QKA45E	Coil	MR3.0 4.5T 0.8	1	
L112	QKA35D	Coil	MR3.0 3.5T 0.6	1	
L113	QKA45E	Coil	MR3.0 4.5T 0.8	1	
L114	QKA45E	Coil	MR3.0 4.5T 0.8	1	
L115	QKA45E	Coil	MR3.0 4.5T 0.8	1	
L116	QKA45E	Coil	MR3.0 4.5T 0.8	1	
L117	QC0065	Chip Inductor	NLV32T-068J-PFS	1	
L118	QKA95D	Coil	MR3.0 9.5T 0.6	1	
L119	QC0542	Chip Inductor	LQW2BHN22J03L	1	
L120	QC0534	Chip Inductor	LQW2BHN47NJ03L	1	
L121	QC0292	Chip Inductor	NLV25T-2R2J-PFS	1	
L122	QC0288	Chip Inductor	NLV25T-1R0J-PFS	1	
L123	QA0162	Coil	#357BN-1652GNA=P3	1	
L124	QC0732	Chip Inductor	LK10051R0K-T	1	
L125	QC0627	Chip Inductor	LL1608-FSLR10J	1	
L126	QC0288	Chip Inductor	NLV25T-1R0J-PFS	1	
L129	QC0534	Chip Inductor	LQW2BHN47NJ03L	1	
Q104	XU0210	Chip	RN1107MFV(TPL3)	1	
Q105	XT0178	Chip	2SC4915-D(T85L,F)	1	
Q106	XE0053	Chip FET	3SK293(T85L,F)	1	
Q107	XE0053	Chip FET	3SK293(T85L,F)	1	
Q108	XU0210	Chip	RN1107MFV(TPL3)	1	
Q109	XT0208	Chip	2SD2620J0L	1	
Q110	XT0208	Chip	2SD2620J0L	1	
Q115	XT0194	Chip	2SC5551-TD-E	1	
Q116	XT0110	Chip	2SA1036K T146Q	1	
Q117	XT0095	Chip	2SC4081 T106R	1	
Q120	XU0210	Chip	RN1107MFV(TPL3)	1	
Q121	XU0178	Chip	XP0121500L	1	
Q122	XT0190	Chip	2SB1386 T100Q	1	
Q123	XT0170	Chip	2SB0766ARL	1	
Q124	XU0209	Chip	EMD6T2R	1	
Q125	XE0021	Chip FET	2SK880-GR(T85L,F)	1	
Q126	XU0210	Chip	RN1107MFV(TPL3)	1	
Q127	XT0095	Chip	2SC4081 T106R	1	
Q128	XU0210	Chip	RN1107MFV(TPL3)	1	
Q129	XU0195	Chip	RN1104(T85L,F)	1	
Q131	XE0066	Chip FET	2SK2539-TB-E	1	
Q132	XU0210	Chip	RN1107MFV(TPL3)	1	
Q133	XU0210	Chip	RN1107MFV(TPL3)	1	
Q134	XT0178	Chip	2SC4915-D(T85L,F)	1	
Q135	XT0178	Chip	2SC4915-D(T85L,F)	1	
Q137	XU0210	Chip	RN1107MFV(TPL3)	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
Q138	XU0210	Chip	RN1107MFV(TPL3)	1	
Q141	XU0211	Chip	RN2107MFV(TPL3)	1	
Q144	XT0095	Chip	2SC4081 T106R	1	
Q145	XT0124	Chip	2SC4215-Y(T85L,F)	1	
Q147	XU0209	Chip	EMD6T2R	1	
Q148	XU0195	Chip	RN1104(T85L,F)	1	
Q149	XU0210	Chip	RN1107MFV(TPL3)	1	
Q401	XU0210	Chip	RN1107MFV(TPL3)	1	
Q402	XU0211	Chip	RN2107MFV(TPL3)	1	
R105	RK3530	Chip R.	ERJ2GEJ221X	1	
R106	RK3554	Chip R.	ERJ2GEJ223X	1	
R107	RK3554	Chip R.	ERJ2GEJ223X	1	
R109	RK3526	Chip R.	ERJ2GEJ101X	1	
R110	RK3526	Chip R.	ERJ2GEJ101X	1	
R112	RK3526	Chip R.	ERJ2GEJ101X	1	
R113	RK3542	Chip R.	ERJ2GEJ222X	1	
R114	RK3540	Chip R.	ERJ2GEJ152X	1	
R116	RK3534	Chip R.	ERJ2GEJ471X	1	
R117	RK3562	Chip R.	ERJ2GEJ104X	1	
R118	RK3526	Chip R.	ERJ2GEJ101X	1	
R125	RK3541	Chip R.	ERJ2GEJ182X	1	
R126	RK3552	Chip R.	ERJ2GEJ153X	1	
R128	RK3562	Chip R.	ERJ2GEJ104X	1	
R129	RK3550	Chip R.	ERJ2GEJ103X	1	
R130	RK3562	Chip R.	ERJ2GEJ104X	1	
R131	RK3562	Chip R.	ERJ2GEJ104X	1	
R132	RK3550	Chip R.	ERJ2GEJ103X	1	
R133	RK3538	Chip R.	ERJ2GEJ102X	1	
R134	RK3553	Chip R.	ERJ2GEJ183X	1	
R136	RK3534	Chip R.	ERJ2GEJ471X	1	
R143	RK3542	Chip R.	ERJ2GEJ222X	1	
R144	RK3542	Chip R.	ERJ2GEJ222X	1	
R145	RK3552	Chip R.	ERJ2GEJ153X	1	
R146	RK3552	Chip R.	ERJ2GEJ153X	1	
R147	RK3550	Chip R.	ERJ2GEJ103X	1	
R148	RK3538	Chip R.	ERJ2GEJ102X	1	
R149	RK3562	Chip R.	ERJ2GEJ104X	1	
R151	RK3550	Chip R.	ERJ2GEJ103X	1	
R152	RK3538	Chip R.	ERJ2GEJ102X	1	
R153	RK3562	Chip R.	ERJ2GEJ104X	1	
R155	RK3552	Chip R.	ERJ2GEJ153X	1	
R156	RK3558	Chip R.	ERJ2GEJ473X	1	
R157	RK3562	Chip R.	ERJ2GEJ104X	1	
R158	RK3522	Chip R.	ERJ2GEJ470X	1	
R160	RK3562	Chip R.	ERJ2GEJ104X	1	
R161	RK3562	Chip R.	ERJ2GEJ104X	1	
R162	RK3521	Chip R.	ERJ2GEJ390X	1	
R163	RK3514	Chip R.	ERJ2GEJ100X	1	
R164	RK3025	Chip R.	MCR03EZPJ820	1	
R165	RK3574	Chip R.	ERJ2GEJ105X	1	
R166	RK3562	Chip R.	ERJ2GEJ104X	1	
R167	RK3564	Chip R.	ERJ2GEJ154X	1	
R168	RK3554	Chip R.	ERJ2GEJ223X	1	
R171	RK3562	Chip R.	ERJ2GEJ104X	1	
R172	RK3562	Chip R.	ERJ2GEJ104X	1	
R173	RK3526	Chip R.	ERJ2GEJ101X	1	
R178	RK3544	Chip R.	ERJ2GEJ332X	1	
R183	RK3568	Chip R.	ERJ2GEJ334X	1	
R184	RK3526	Chip R.	ERJ2GEJ101X	1	
R185	RK3570	Chip R.	ERJ2GEJ474X	1	
R186	RK3562	Chip R.	ERJ2GEJ104X	1	
R187	RK3558	Chip R.	ERJ2GEJ473X	1	
R189	RK3538	Chip R.	ERJ2GEJ102X	1	
R190	RK3538	Chip R.	ERJ2GEJ102X	1	
R191	RK3538	Chip R.	ERJ2GEJ102X	1	
R193	RK3538	Chip R.	ERJ2GEJ102X	1	
R195	RK3570	Chip R.	ERJ2GEJ474X	1	
R196	RK3538	Chip R.	ERJ2GEJ102X	1	
R200	RK3570	Chip R.	ERJ2GEJ474X	1	
R202	RK0028	Chip R.	ERJ6GEYJ471V	1	
R203	RK3556	Chip R.	ERJ2GEJ333X	1	
R204	RK3562	Chip R.	ERJ2GEJ104X	1	
R205	RK0069	Chip R.	ERJ6GEYJ104V	1	
R206	RK0003	Chip R.	ERJ6GEYJ150V	1	
R207	RK3552	Chip R.	ERJ2GEJ153X	1	
R208	RK3534	Chip R.	ERJ2GEJ471X	1	
R209	RK3561	Chip R.	ERJ2GEJ823X	1	
R210	RK3538	Chip R.	ERJ2GEJ102X	1	
R211	RK4018	Chip R.	ERJ12YJ220U	1	
R212	RK4026	Chip R.	ERJ12YJ101U	1	
R213	RK3549	Chip R.	ERJ2GEJ822X	1	
R214	RK3550	Chip R.	ERJ2GEJ103X	1	
R215	RK3543	Chip R.	ERJ2GEJ272X	1	
R216	RK3050	Chip R.	MCR03EZPJ103	1	
R217	RK3050	Chip R.	MCR03EZPJ103	1	
R218	RK3554	Chip R.	ERJ2GEJ223X	1	
R219	RK3538	Chip R.	ERJ2GEJ102X	1	
R220	RK4034	Chip R.	ERJ12YJ471U	1	
R222	RK3550	Chip R.	ERJ2GEJ103X	1	
R223	RK3526	Chip R.	ERJ2GEJ101X	1	
R224	RK3526	Chip R.	ERJ2GEJ101X	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
R225	RK3545	Chip R.	ERJ2GEJ392X	1	
R226	RK3038	Chip R.	MCR03EZPJ102	1	
R227	RK3501	Chip R.	ERJ2GE0R00X	1	
R228	RK3538	Chip R.	ERJ2GEJ102X	1	
R229	RK3551	Chip R.	ERJ2GEJ123X	1	
R230	RK3546	Chip R.	ERJ2GEJ472X	1	
R231	RK3050	Chip R.	MCR03EZPJ103	1	
R232	RK3526	Chip R.	ERJ2GEJ101X	1	
R233	RK3538	Chip R.	ERJ2GEJ102X	1	
R234	RK3556	Chip R.	ERJ2GEJ333X	1	
R235	RK3562	Chip R.	ERJ2GEJ104X	1	
R236	RK3551	Chip R.	ERJ2GEJ123X	1	
R237	RK3526	Chip R.	ERJ2GEJ101X	1	
R238	RK3562	Chip R.	ERJ2GEJ104X	1	
R239	RK3550	Chip R.	ERJ2GEJ103X	1	
R241	RK3550	Chip R.	ERJ2GEJ103X	1	
R242	RK3522	Chip R.	ERJ2GEJ470X	1	
R243	RK3550	Chip R.	ERJ2GEJ103X	1	
R244	RK3568	Chip R.	ERJ2GEJ334X	1	
R247	RK3538	Chip R.	ERJ2GEJ102X	1	
R249	RK3058	Chip R.	MCR03EZPJ473	1	
R251	RK3550	Chip R.	ERJ2GEJ103X	1	
R253	RK3557	Chip R.	ERJ2GEJ393X	1	
R254	RK3557	Chip R.	ERJ2GEJ393X	1	
R255	RK3546	Chip R.	ERJ2GEJ472X	1	
R256	RK3526	Chip R.	ERJ2GEJ101X	1	
R258	RK3557	Chip R.	ERJ2GEJ393X	1	
R259	RK3550	Chip R.	ERJ2GEJ103X	1	
R261	RK3554	Chip R.	ERJ2GEJ223X	1	
R262	RK3562	Chip R.	ERJ2GEJ104X	1	
R264	RK3538	Chip R.	ERJ2GEJ102X	1	
R265	RK3546	Chip R.	ERJ2GEJ472X	1	
R266	RK3550	Chip R.	ERJ2GEJ103X	1	
R267	RK3522	Chip R.	ERJ2GEJ470X	1	
R268	RK3550	Chip R.	ERJ2GEJ103X	1	
R269	RK3562	Chip R.	ERJ2GEJ104X	1	
R270	RK3560	Chip R.	ERJ2GEJ683X	1	
R271	RK4034	Chip R.	ERJ12YJ471U	1	
R272	RK3550	Chip R.	ERJ2GEJ103X	1	
R273	RK3562	Chip R.	ERJ2GEJ104X	1	
R274	RK3550	Chip R.	ERJ2GEJ103X	1	
R275	RK3550	Chip R.	ERJ2GEJ103X	1	
R276	RK3534	Chip R.	ERJ2GEJ471X	1	
R278	RK3526	Chip R.	ERJ2GEJ101X	1	
R279	RK3046	Chip R.	MCR03EZPJ472	1	
R280	RK3558	Chip R.	ERJ2GEJ473X	1	
R281	RK3041	Chip R.	MCR03EZPJ182	1	
R282	RK3550	Chip R.	ERJ2GEJ103X	1	
R283	RK3038	Chip R.	MCR03EZPJ102	1	
R284	RK3526	Chip R.	ERJ2GEJ101X	1	
R286	RK3534	Chip R.	ERJ2GEJ471X	1	
R287	RK3546	Chip R.	ERJ2GEJ472X	1	
R288	RK3547	Chip R.	ERJ2GEJ562X	1	
R289	RK3540	Chip R.	ERJ2GEJ152X	1	
R290	RK3554	Chip R.	ERJ2GEJ223X	1	
R292	RK3518	Chip R.	ERJ2GEJ220X	1	
R293	RK3542	Chip R.	ERJ2GEJ222X	1	
R294	RK3546	Chip R.	ERJ2GEJ472X	1	
R296	RK3568	Chip R.	ERJ2GEJ334X	1	
R298	RK3542	Chip R.	ERJ2GEJ222X	1	
R299	RK3542	Chip R.	ERJ2GEJ222X	1	
R300	RK3526	Chip R.	ERJ2GEJ101X	1	
R301	RK3538	Chip R.	ERJ2GEJ102X	1	
R302	RK3524	Chip R.	ERJ2GEJ680X	1	
R303	RK3547	Chip R.	ERJ2GEJ562X	1	
R304	RK3547	Chip R.	ERJ2GEJ562X	1	
R305	RK3558	Chip R.	ERJ2GEJ473X	1	
R307	RK3543	Chip R.	ERJ2GEJ272X	1	
R308	RK3526	Chip R.	ERJ2GEJ101X	1	
R309	RK3550	Chip R.	ERJ2GEJ103X	1	
R310	RK3526	Chip R.	ERJ2GEJ101X	1	
R311	RK3538	Chip R.	ERJ2GEJ102X	1	
R312	RK3538	Chip R.	ERJ2GEJ102X	1	
R313	RK3538	Chip R.	ERJ2GEJ102X	1	
R315	RK3544	Chip R.	ERJ2GEJ332X	1	
R321	RK3543	Chip R.	ERJ2GEJ272X	1	
R322	RD0108	Jumper	J1/6ZC	1	
R323	RK3554	Chip R.	ERJ2GEJ223X	1	
R325	RK3566	Chip R.	ERJ2GEJ224X	1	
R337	RK3570	Chip R.	ERJ2GEJ474X	1	
R339	RK3550	Chip R.	ERJ2GEJ103X	1	
R340	RK3550	Chip R.	ERJ2GEJ103X	1	
R341	RK3561	Chip R.	ERJ2GEJ823X	1	
R342	RK3545	Chip R.	ERJ2GEJ392X	1	
R344	RK3550	Chip R.	ERJ2GEJ103X	1	
R345	RK3501	Chip R.	ERJ2GE0R00X	1	
R346	RK3561	Chip R.	ERJ2GEJ823X	1	
R347	RK3551	Chip R.	ERJ2GEJ123X	1	
R348	RK3534	Chip R.	ERJ2GEJ471X	1	
R349	RK3562	Chip R.	ERJ2GEJ104X	1	
R401	RK3553	Chip R.	ERJ2GEJ183X	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
R402	RK3551	Chip R.	ERJ2GEJ123X	1	
R403	RK3542	Chip R.	ERJ2GEJ222X	1	
R404	RK3562	Chip R.	ERJ2GEJ104X	1	
R405	RK3563	Chip R.	ERJ2GEJ124X	1	
R406	RK3559	Chip R.	ERJ2GEJ563X	1	
R407	RK3562	Chip R.	ERJ2GEJ104X	1	
R408	RK3558	Chip R.	ERJ2GEJ473X	1	
R409	RK3560	Chip R.	ERJ2GEJ683X	1	
R410	RK3557	Chip R.	ERJ2GEJ393X	1	
R411	RK3562	Chip R.	ERJ2GEJ104X	1	
R412	RK3550	Chip R.	ERJ2GEJ103X	1	
R413	RK3550	Chip R.	ERJ2GEJ103X	1	
R414	RK3566	Chip R.	ERJ2GEJ224X	1	
R415	RK3558	Chip R.	ERJ2GEJ473X	1	
R416	RK3550	Chip R.	ERJ2GEJ103X	1	
R417	RK3570	Chip R.	ERJ2GEJ474X	1	
R418	RK3560	Chip R.	ERJ2GEJ683X	1	
R419	RK3550	Chip R.	ERJ2GEJ103X	1	
R420	RK3574	Chip R.	ERJ2GEJ105X	1	
R421	RK3568	Chip R.	ERJ2GEJ334X	1	
R422	RK3562	Chip R.	ERJ2GEJ104X	1	
R423	RK3501	Chip R.	ERJ2GE0R00X	1	
R424	RK3501	Chip R.	ERJ2GE0R00X	1	
R429	RK3501	Chip R.	ERJ2GE0R00X	1	
R431	RK3558	Chip R.	ERJ2GEJ473X	1	
R601	RK3558	Chip R.	ERJ2GEJ473X	1	
R603	RK3554	Chip R.	ERJ2GEJ223X	1	
R609	RK3522	Chip R.	ERJ2GEJ470X	1	
R611	RK3564	Chip R.	ERJ2GEJ154X	1	
R613	RK3574	Chip R.	ERJ2GEJ105X	1	
R615	RK3574	Chip R.	ERJ2GEJ105X	1	
R617	RK3562	Chip R.	ERJ2GEJ104X	1	
R619	RK3546	Chip R.	ERJ2GEJ472X	1	
R621	RK3556	Chip R.	ERJ2GEJ333X	1	
R623	RK3546	Chip R.	ERJ2GEJ472X	1	
R627	RK3542	Chip R.	ERJ2GEJ222X	1	
R629	RK3550	Chip R.	ERJ2GEJ103X	1	
R631	RK3562	Chip R.	ERJ2GEJ104X	1	
R635	RK3574	Chip R.	ERJ2GEJ105X	1	
R637	RK3501	Chip R.	ERJ2GE0R00X	1	
SH101	TS0172	Case	VCO CASE DR620	1	
TC601	CT0046	Trimmer C.	TC03C100A-TP02	1	
TH101	XS0031	Chip	NTCG164BH682JT-S	1	
TH102	XS0050	Chip	NTCG164QH105JT-S	1	
VR101	RH0233	Trimmer R.	RH02B1C15X	1	
VR102	RH0231	Trimmer R.	RH02B1CS4X	1	
VR103	RH0231	Trimmer R.	RH02B1CS4X	1	
VR104	RH0233	Trimmer R.	RH02B1C15X	1	
VR106	RH0231	Trimmer R.	RH02B1CS4X	1	
VR107	RH0225	Trimmer R.	RH02B1CS3X	1	
VR108	RH0233	Trimmer R.	RH02B1C15X	1	
VR109	RH0231	Trimmer R.	RH02B1CS4X	1	
X101	XK0003	Discriminator	CDBLB450KCAY07-B0	1	
X604	XQ0112	Xtal	UM-5 21.25MHZ	1	
XF101	XF0041	Xtal Filter	UM5 21.7M 21R15A5	1	
XF102	XF0041	Xtal Filter	UM5 21.7M 21R15A5	1	
	FG0320	SP Cushlon	SP CUSHION DR135	1	
	FG0327	Cushion	CUSHION DR135	1	
	SD0034	Spring	GND SPRING DR130	2	
	TZ0049	Dumper	SILICON DUMPER	3	
	UP0538A	P.C. BOARD	DR135FX INTEGRATED	1	

## MAIN Unit DR-435

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
C104	CU3547	Chip C.	GRM155B11C103KA01D	1	
C105	CE0364	Electrolytic C.	16ME47SWB+TS	1	
C107	CU3554	Chip C.	GRM155B11A104KA01D	1	
C108	CU3547	Chip C.	GRM155B11C103KA01D	1	
C109	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C110	CU3547	Chip C.	GRM155B11C103KA01D	1	
C111	CU3554	Chip C.	GRM155B11A104KA01D	1	
C112	CU3554	Chip C.	GRM155B11A104KA01D	1	
C113	CU3047	Chip C.	C1608JB1H103KT-NS	1	
C114	CU3547	Chip C.	GRM155B11C103KA01D	1	
C116	CU3019	Chip C.	C1608CH1H470JT-NS	1	
C117	CU3547	Chip C.	GRM155B11C103KA01D	1	
C120	CU3522	Chip C.	GRM1552C1H820JD01D	1	
C121	CU3535	Chip C.	GRM155B11H102KA01D	1	
C123	CU3512	Chip C.	GRM1552C1H120JZ01D	1	
C129	CU3547	Chip C.	GRM155B11C103KA01D	1	
C130	CU0108	Chip C.	LMK212B1J05KG-T	1	
C131	CU3535	Chip C.	GRM155B11H102KA01D	1	
C132	CU3535	Chip C.	GRM155B11H102KA01D	1	
C133	CU3527	Chip C.	GRM1552C1E221JD01D	1	
C135	CU3547	Chip C.	GRM155B11C103KA01D	1	
C136	CU3011	Chip C.	C1608CH1H100DT-NS	1	
C137	CU3517	Chip C.	GRM1552C1H330JZ01D	1	
C139	CU3531	Chip C.	GRM155B11H471KA01D	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
C140	CU3535	Chip C.	GRM155B11H102KA01D	1	
C141	CU3512	Chip C.	GRM1552C1H120JZ01D	1	
C142	CU3515	Chip C.	GRM1552C1H220JZ01D	1	
C143	CU3554	Chip C.	GRM155B11A104KA01D	1	
C144	CU3512	Chip C.	GRM1552C1H120JZ01D	1	
C145	CU3064	Chip C.	C1608CH1H1R5CT-NS	1	
C146	CE0364	Electrolytic C.	16ME47SWB+TS	1	
C151	CU3535	Chip C.	GRM155B11H102KA01D	1	
C152	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C153	CU3003	Chip C.	C1608CH1H020CT-NS	1	
C154	CU3535	Chip C.	GRM155B11H102KA01D	1	
C155	CU3511	Chip C.	GRM1552C1H100JZ01D	1	
C157	CU3535	Chip C.	GRM155B11H102KA01D	1	
C158	CU3504	Chip C.	GRM1553C1H3R0CZ01D	1	
C159	CU3518	Chip C.	GRM1552C1H390JZ01D	1	
C161	CU3554	Chip C.	GRM155B11A104KA01D	1	
C164	CU3535	Chip C.	GRM155B11H102KA01D	1	
C165	CU3559	Chip C.	GRM155B30J105KE18D	1	
C166	CE0420	Electrolytic C.	16ME22SZ	1	
C167	CU3535	Chip C.	GRM155B11H102KA01D	1	
C169	CU3527	Chip C.	GRM1552C1E221JD01D	1	
C170	CU3554	Chip C.	GRM155B11A104KA01D	1	
C171	CU3516	Chip C.	GRM1552C1H270JZ01D	1	
C173	CU3537	Chip C.	GRM155B11H152KA01D	1	
C174	CU3527	Chip C.	GRM1552C1E221JD01D	1	
C175	CU3535	Chip C.	GRM155B11H102KA01D	1	
C176	CU3516	Chip C.	GRM1552C1H270JZ01D	1	
C178	CU3554	Chip C.	GRM155B11A104KA01D	1	
C179	CU3554	Chip C.	GRM155B11A104KA01D	1	
C180	CU3535	Chip C.	GRM155B11H102KA01D	1	
C181	CU3535	Chip C.	GRM155B11H102KA01D	1	
C182	CU3547	Chip C.	GRM155B11C103KA01D	1	
C183	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C184	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C185	CS0232	Chip tantalum	TMCMA1V474MTRF	1	
C186	CU3506	Chip C.	GRM1552C1H5R0CZ01D	1	
C187	CU3535	Chip C.	GRM155B11H102KA01D	1	
C188	CU3535	Chip C.	GRM155B11H102KA01D	1	
C189	CU3015	Chip C.	C1608CH1H220JT-NS	1	
C190	CU3547	Chip C.	GRM155B11C103KA01D	1	
C191	CU3552	Chip C.	GRM155B11A333KA01D	1	
C192	CU3547	Chip C.	GRM155B11C103KA01D	1	
C193	CU4033	Chip C.	GRM31BR72J102KW01L	1	
C194	CU3004	Chip C.	C1608CH1H030CT-NS	1	
C195	CU3535	Chip C.	GRM155B11H102KA01D	1	
C196	CU3504	Chip C.	GRM1553C1H3R0CZ01D	1	
C199	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C200	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C201	CU4003	Chip C.	GRM31M4C2H2R0CY21L	1	
C202	CU4011	Chip C.	GRM31M2C2H100JV01L	1	
C203	CU4004	Chip C.	GRM31M3C2H3R0CY21L	1	
C204	CU4003	Chip C.	GRM31M4C2H2R0CY21L	1	
C205	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C206	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C207	CU3001	Chip C.	C1608CH1H0R5CT-NS	1	
C208	CU3001	Chip C.	C1608CH1H0R5CT-NS	1	
C209	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C210	CU3005	Chip C.	C1608CH1H040CT-NS	1	
C211	CU3005	Chip C.	C1608CH1H040CT-NS	1	
C212	CE0364	Electrolytic C.	16ME47SWB+TS	1	
C213	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C215	CU4008	Chip C.	GRM31M2C2H7R0DV01L	1	
C216	CU4011	Chip C.	GRM31M2C2H100JV01L	1	
C217	CU3551	Chip C.	GRM155B11C223KA01D	1	
C218	CU3551	Chip C.	GRM155B11C223KA01D	1	
C219	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C220	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C221	CU3547	Chip C.	GRM155B11C103KA01D	1	
C222	CU3535	Chip C.	GRM155B11H102KA01D	1	
C223	CE0364	Electrolytic C.	16ME47SWB+TS	1	
C224	CU3023	Chip C.	C1608CH1H101JT-NS	1	
C225	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C226	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C227	CU0108	Chip C.	LMK212BJ105KG-T	1	
C228	CU3535	Chip C.	GRM155B11H102KA01D	1	
C229	CU3553	Chip C.	GRM155B11A473KA01D	1	
C230	CU3535	Chip C.	GRM155B11H102KA01D	1	
C231	CU3535	Chip C.	GRM155B11H102KA01D	1	
C232	CU3535	Chip C.	GRM155B11H102KA01D	1	
C236	CU3535	Chip C.	GRM155B11H102KA01D	1	
C237	CU3535	Chip C.	GRM155B11H102KA01D	1	
C238	CU3111	Chip C.	C1608JB1E104KT-NS	1	
C239	CU3535	Chip C.	GRM155B11H102KA01D	1	
C241	CU3522	Chip C.	GRM1552C1H820JD01D	1	
C242	CU3551	Chip C.	GRM155B11C223KA01D	1	
C243	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C244	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C245	CS0405Z	Chip tantalum	TAJA475M010Y	1	
C246	CU3543	Chip C.	GRM155B11E472KA01D	1	
C248	CU3547	Chip C.	GRM155B11C103KA01D	1	
C249	CU3538	Chip C.	GRM155B11H182KA01D	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
C250	CU3526	Chip C.	GRM1552C1E181JD01D	1	
C252	CU3535	Chip C.	GRM155B11H102KA01D	1	
C253	CU3551	Chip C.	GRM155B11C223KA01D	1	
C254	CU3111	Chip C.	C1608JB1E104KT-NS	1	
C255	CE0364	Electrolytic C.	16ME47SWB+TS	1	
C256	CU3111	Chip C.	C1608JB1E104KT-NS	1	
C257	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C258	CU0108	Chip C.	LMK212BJ105KG-T	1	
C262	CU3535	Chip C.	GRM155B11H102KA01D	1	
C263	CS0424	Chip tantalum	TMCMA1C106MTRF	1	
C264	CU3511	Chip C.	GRM1552C1H100JZ01D	1	
C265	CU3535	Chip C.	GRM155B11H102KA01D	1	
C266	CU3503	Chip C.	GRM1554C1H2R0CZ01D	1	
C269	CU3535	Chip C.	GRM155B11H102KA01D	1	
C270	CU3047	Chip C.	C1608JB1H103KT-NS	1	
C272	CS0220	Chip tantalum	TMCMA1C225MTRF	1	
C273	CS0220	Chip tantalum	TMCMA1C225MTRF	1	
C274	CU3535	Chip C.	GRM155B11H102KA01D	1	
C276	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C277	CE0343	Electrolytic C.	16ME1000HC+T	1	
C278	CU3535	Chip C.	GRM155B11H102KA01D	1	
C279	CU3551	Chip C.	GRM155B11C223KA01D	1	
C281	CU3504	Chip C.	GRM1553C1H3R0CZ01D	1	
C282	CU3502	Chip C.	GRM1554C1H1R0CZ01D	1	
C283	CU3523	Chip C.	GRM1552C1H101JD01D	1	
C285	CU3535	Chip C.	GRM155B11H102KA01D	1	
C286	CU3027	Chip C.	C1608CH1H221JT-NS	1	
C287	CS0363	Chip tantalum	TMCMA1V104MTRF	1	
C288	CU3506	Chip C.	GRM1552C1H5R0CZ01D	1	
C289	CU3535	Chip C.	GRM155B11H102KA01D	1	
C290	CU3535	Chip C.	GRM155B11H102KA01D	1	
C294	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C295	CU3551	Chip C.	GRM155B11C223KA01D	1	
C296	CU3503	Chip C.	GRM1554C1H2R0CZ01D	1	
C297	CU3535	Chip C.	GRM155B11H102KA01D	1	
C300	CU3511	Chip C.	GRM1552C1H100JZ01D	1	
C301	CU3523	Chip C.	GRM1552C1H101JD01D	1	
C302	CU3523	Chip C.	GRM1552C1H101JD01D	1	
C303	CU3523	Chip C.	GRM1552C1H101JD01D	1	
C304	CU3535	Chip C.	GRM155B11H102KA01D	1	
C305	CU3547	Chip C.	GRM155B11C103KA01D	1	
C306	CU3554	Chip C.	GRM155B11A104KA01D	1	
C307	CU3547	Chip C.	GRM155B11C103KA01D	1	
C308	CE0342	Electrolytic C.	16ME470HC+TS	1	
C309	CU3551	Chip C.	GRM155B11C223KA01D	1	
C310	CU3523	Chip C.	GRM1552C1H101JD01D	1	
C311	CU3535	Chip C.	GRM155B11H102KA01D	1	
C312	CU3506	Chip C.	GRM1552C1H5R0CZ01D	1	
C318	CU3535	Chip C.	GRM155B11H102KA01D	1	
C321	CS0220	Chip tantalum	TMCMA1C225MTRF	1	
C322	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C326	CU0108	Chip C.	LMK212BJ105KG-T	1	
C331	CU3547	Chip C.	GRM155B11C103KA01D	1	
C332	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C333	CU3535	Chip C.	GRM155B11H102KA01D	1	
C385	CU0108	Chip C.	LMK212BJ105KG-T	1	
C401	CU3549	Chip C.	GRM155B11C153KA01D	1	
C402	CU3550	Chip C.	GRM155B11C183KA01D	1	
C403	CU3552	Chip C.	GRM155B11A333KA01D	1	
C404	CU3559	Chip C.	GRM155B30J105KE18D	1	
C405	CU3541	Chip C.	GRM155B11H332KA01D	1	
C406	CU3545	Chip C.	GRM155B11E682KA01D	1	
C407	CU3540	Chip C.	GRM155B11H272KA01D	1	
C408	CU3544	Chip C.	GRM155B11E562KA01D	1	
C409	CU3536	Chip C.	GRM155B11H122KA01D	1	
C410	CU3539	Chip C.	GRM155B11H222KA01D	1	
C412	CU0108	Chip C.	LMK212BJ105KG-T	1	
C413	CU3541	Chip C.	GRM155B11H332KA01D	1	
C414	CU3542	Chip C.	GRM155B11H392KA01D	1	
C415	CU3545	Chip C.	GRM155B11E682KA01D	1	
C417	CU3548	Chip C.	GRM155B11C123KA01D	1	
C418	CU3547	Chip C.	GRM155B11C103KA01D	1	
C419	CU3548	Chip C.	GRM155B11C123KA01D	1	
C420	CE0339	Electrolytic C.	16ME10SWB+TS-ALC	1	
C421	CU3035	Chip C.	C1608JB1H102KT-NS	1	
C422	CS0220	Chip tantalum	TMCMA1C225MTRF	1	
C423	CU3111	Chip C.	C1608JB1E104KT-NS	1	
C424	CU3535	Chip C.	GRM155B11H102KA01D	1	
C427	CU3559	Chip C.	GRM155B30J105KE18D	1	
C428	CU0110	Chip C.	C2012JB1A475KT-NS	1	
CN101	UE0369	Connector	AXN49301618	1	
CN102	UE0293	Connector	17PS-JE	1	
CN103	UE0293	Connector	17PS-JE	1	
CN104	UA0037AY	Wire	R-B2.0X0.2M PLUG 15A	1	
CN106	UE0043	Connector	PI22A02M	1	
CN109	UE0041	Connector	TMPJ01XV6	1	
D101	XD0141	Chip Diode	1SV237(TE85L,F)	1	
D102	XD0254	Chip Diode	1SS355 TE17	1	
D106	XD0402	Chip Diode	VDZT2R 5.1B	1	
D107	XD0141	Chip Diode	1SV237(TE85L,F)	1	
D108	XC0254	Chip Diode	1SS355 TE17	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
D709	X00301	Chip Diode	1S1V266-TD-E	1	
D110	X00013	Diode	L407C08	1	
D111	X00375	Chip Diode	MAA4271300L	1	
D112	X00375	Chip Diode	MAA4271300L	1	
D113	X00323	Chip Diode	MAZ511100L	1	
D114	X00141	Chip Diode	1S1V237(TTE85L,F)	1	
D115	X00320	Chip Diode	DAN235E-TL	1	
D116	X00320	Chip Diode	DAN235E-TL	1	
D118	X00130	Chip Diode	DA204U 1106	1	
D110	X00323	Chip Diode	MAZ511100L	1	
D120	X00374	Chip Diode	1S1V278(TPH2,F)	1	
D121	X00414	Diode	S3V60-5000	1	
D122	X00384	Chip Diode	1S1V279(TPH3)	1	
D123	X00384	Chip Diode	1S1V279(TPH3)	1	
D124	X00377	Chip Diode	MAZ50270HL	1	
D130	X00323	Chip Diode	MAZ511100L	1	
D136	X00395	Chip Diode	UD25 TE-17 5.68	1	
D402	X00323	Chip Diode	MAZ511100L	1	
FL101	X00047	Ceramic Filter	ALFYM455G-K	1	
FL102	X00036	Ceramic Filter	ALFYM455G-K	1	
IC101	XA0947	IC	NLM78M050D1A1TE#ZZ	1	
IC104	XA1106	IC	LM2902PWR	1	
IC108	XA0404	IC	TA31136(FNG(EL)	1	
IC109	XA0115	IC	TC4566F(TTE5R,F)	1	
IC110	XA0115	IC	S-AU82L(F)	1	
IC111	XA0112	IC	TC4566F(TTE5R,F)	1	
IC112	XA0019	IC	AN8010M-EI	1	
IC113	XA0115	IC	TC4566F(TTE5R,F)	1	
IC114	XA1106	IC	LM2902PWR	1	
IC115	XA0102	IC	NLM78M050D1A1TE#ZZ	1	
IC116	XA1107	IC	MB15E07SRFTGBNDE	1	
IC117	XA0410	IC	LA4425A-E	1	
IC120	XA1103	IC	LM2904PWR	1	
JK102	UJ00242	Jack	LGJ6501-0800FC	1	
L101	Q00043	Coil Inductor	NL V321-2R2LPFS	1	
L102	DA0165	Coil	#252MNP-R-3213A	1	
L103	DA0165	Coil	#252MNP-R-3213A	1	
L104	Q00057	Chip Inductor	NL V321-015LPFS	1	
L105	Q00057	Chip Inductor	NL V321-015LPFS	1	
L106	Q00055	Chip Inductor	NL V321-010LPFS	1	
L108	Q00124	Chip Inductor	NL V321-015LPFS	1	
L109	Q00061	Chip Inductor	NL V321-R16L-PFS	1	
L111	QK425E	Coil	MR3.0 2.5T 0.8	1	
L112	QK415D	Coil	MR3.0 1.5T 0.6	1	
L113	QK415E	Coil	MR3.0 1.5T 0.8	1	
L114	QK415E	Coil	MR3.0 1.5T 0.8	1	
L115	QK415E	Coil	MR3.0 1.5T 0.8	1	
L117	QK425D	Coil	MR3.0 2.5T 0.6	1	
L118	QK495D	Coil	MR3.0 9.5T 0.6	1	
L119	Q00358	Chip Inductor	LQW28HN-R10L03L	1	
L120	Q00599	Chip Inductor	NL V321-022LPFS	1	
L121	Q00740	Chip Inductor	KO0805TTER82J	1	
L122	Q00740	Chip Inductor	KO0805TTER82J	1	
L123	DA0163	Coil	SMD-1380	1	
L126	Q00627	Chip Inductor	LL1608-FSLR10J	1	
Q108	XU0209	Chip	KO0805TTER33J	1	
Q104	XU0210	Chip	EMD612R	1	
Q105	XU0125	Chip	RN1107MF(VTPL3)	1	
Q106	XE0053	Chip FET	2SC4245-VTTE85L	1	
Q107	XE0053	Chip FET	3SK393(TTE85L,F)	1	
Q108	XU0210	Chip	3SK393(TTE85L,F)	1	
Q109	XU0208	Chip	RN1107MF(VTPL3)	1	
Q110	XU0208	Chip	2SD2620J0L	1	
Q111	XU0141	Chip	2SC4226-T1(R24)	1	
Q112	XU0141	Chip	2SC4226-T1(R24)	1	
Q113	XU0209	Chip	EMD612R	1	
Q114	XU0210	Chip	RN1107MF(VTPL3)	1	
Q115	XU0194	Chip	2SC5551-TD-E	1	
Q116	XU0110	Chip	2SA1036K T146Q	1	
Q117	XU0095	Chip	2SC4081 T106R	1	
Q120	XU0210	Chip	RN1107MF(VTPL3)	1	
Q121	XU0178	Chip	XP0121500L	1	
Q122	XU0190	Chip	2SB1386 T100Q	1	
Q123	XU0170	Chip	2SB0766ARL	1	
Q124	XU0209	Chip	EMD612R	1	
Q126	XU0210	Chip	RN1107MF(VTPL3)	1	
Q127	XU0095	Chip	2SC4081 T106R	1	
Q128	XU0210	Chip	RN1107MF(VTPL3)	1	
Q129	XU0195	Chip	RN1104(TTE85L,F)	1	
Q131	XE0066	Chip FET	2SC5359-TB-E	1	
Q132	XU0210	Chip	2SC5359-TB-E	1	
Q133	XU0210	Chip	RN1107MF(VTPL3)	1	
Q184	XU0125	Chip	RN1107MF(VTPL3)	1	
Q184	XU0125	Chip	2SC4245-VTTE85L	1	
Q137	XU0210	Chip	RN1107MF(VTPL3)	1	
Q138	XU0141	Chip	2SC4226-T1(R24)	1	
Q141	XU0211	Chip	2SC4226-T1(R24)	1	
Q144	XU0095	Chip	RN2107MF(VTPL3)	1	
Q145	XU0125	Chip	2SC4081 T106R	1	
Q145	XU0125	Chip	2SC4245-VTTE85L	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
Q147	XU0209	Chip	EMD612R	1	
Q148	XU0195	Chip	RN1104(TTE85L,F)	1	
Q149	XU0210	Chip	RN1107MF(VTPL3)	1	
Q401	XU0210	Chip	RN1107MF(VTPL3)	1	
Q402	XU0211	Chip	RN2107MF(VTPL3)	1	
R105	RK3530	Chip R.	ERJ2GEJ223X	1	
R106	RK3554	Chip R.	ERJ2GEJ223X	1	
R107	RK3528	Chip R.	ERJ2GEJ101X	1	
R109	RK3528	Chip R.	ERJ2GEJ101X	1	
R110	RK3526	Chip R.	ERJ2GEJ470X	1	
R112	RK3522	Chip R.	ERJ2GEJ133X	1	
R113	RK3544	Chip R.	ERJ2GEJ133X	1	
R114	RK3540	Chip R.	ERJ2GEJ152X	1	
R116	RK3530	Chip R.	ERJ2GEJ122X	1	
R117	RK3570	Chip R.	ERJ2GEJ474X	1	
R118	RK3526	Chip R.	ERJ2GEJ101X	1	
R128	RK3562	Chip R.	ERJ2GEJ104X	1	
R126	RK3535	Chip R.	ERJ2GEJ1561X	1	
R125	RK3535	Chip R.	ERJ2GEJ153X	1	
R128	RK3562	Chip R.	ERJ2GEJ104X	1	
R130	RK3562	Chip R.	ERJ2GEJ103X	1	
R131	RK3562	Chip R.	ERJ2GEJ103X	1	
R132	RK3550	Chip R.	ERJ2GEJ101X	1	
R133	RK3526	Chip R.	ERJ2GEJ103X	1	
R134	RK3553	Chip R.	ERJ2GEJ183X	1	
R136	RK3534	Chip R.	ERJ2GEJ1471X	1	
R138	RK3562	Chip R.	ERJ2GEJ104X	1	
R139	RK3562	Chip R.	ERJ2GEJ104X	1	
R140	RK3554	Chip R.	ERJ2GEJ1223X	1	
R143	RK3522	Chip R.	ERJ2GEJ1470X	1	
R144	RK3542	Chip R.	ERJ2GEJ1222X	1	
R145	RK3552	Chip R.	ERJ2GEJ153X	1	
R146	RK3552	Chip R.	ERJ2GEJ153X	1	
R147	RK3550	Chip R.	ERJ2GEJ103X	1	
R148	RK3538	Chip R.	ERJ2GEJ102X	1	
R151	RK3550	Chip R.	ERJ2GEJ102X	1	
R152	RK3538	Chip R.	ERJ2GEJ102X	1	
R153	RK3562	Chip R.	ERJ2GEJ104X	1	
R164	RK3542	Chip R.	ERJ2GEJ1222X	1	
R155	RK3551	Chip R.	ERJ2GEJ123X	1	
R156	RK3558	Chip R.	ERJ2GEJ1473X	1	
R168	RK3526	Chip R.	ERJ2GEJ101X	1	
R172	RK3556	Chip R.	ERJ2GEJ101X	1	
R176	RK3544	Chip R.	ERJ2GEJ1332X	1	
R177	RK3544	Chip R.	ERJ2GEJ1332X	1	
R178	RK3542	Chip R.	ERJ2GEJ101X	1	
R180	RK3538	Chip R.	ERJ2GEJ102X	1	
R181	RK3562	Chip R.	ERJ2GEJ104X	1	
R182	RK3542	Chip R.	ERJ2GEJ102X	1	
R183	RK3568	Chip R.	ERJ2GEJ1334X	1	
R184	RK3526	Chip R.	ERJ2GEJ101X	1	
R185	RK3570	Chip R.	ERJ2GEJ1474X	1	
R186	RK3562	Chip R.	ERJ2GEJ104X	1	
R187	RK3562	Chip R.	ERJ2GEJ104X	1	
R188	RK3554	Chip R.	ERJ2GEJ1223X	1	
R172	RK3556	Chip R.	ERJ2GEJ1333X	1	
R176	RK3526	Chip R.	ERJ2GEJ101X	1	
R178	RK3542	Chip R.	ERJ2GEJ101X	1	
R180	RK3538	Chip R.	ERJ2GEJ102X	1	
R181	RK3562	Chip R.	ERJ2GEJ104X	1	
R182	RK3542	Chip R.	ERJ2GEJ102X	1	
R183	RK3568	Chip R.	ERJ2GEJ1334X	1	
R184	RK3526	Chip R.	ERJ2GEJ101X	1	
R185	RK3570	Chip R.	ERJ2GEJ1474X	1	
R186	RK3562	Chip R.	ERJ2GEJ104X	1	
R187	RK3562	Chip R.	ERJ2GEJ104X	1	
R188	RK3554	Chip R.	ERJ2GEJ1223X	1	
R189	RK3526	Chip R.	ERJ2GEJ101X	1	
R189	RK3538	Chip R.	ERJ2GEJ102X	1	
R190	RK3538	Chip R.	ERJ2GEJ102X	1	
R191	RK3538	Chip R.	ERJ2GEJ102X	1	
R193	RK3538	Chip R.	ERJ2GEJ102X	1	
R195	RK3570	Chip R.	ERJ2GEJ1474X	1	
R196	RK3538	Chip R.	ERJ2GEJ102X	1	
R197	RK3550	Chip R.	ERJ2GEJ103X	1	
R198	RK3542	Chip R.	ERJ2GEJ1222X	1	
R199	RK3542	Chip R.	ERJ2GEJ1222X	1	
R200	RK3570	Chip R.	ERJ2GEJ1474X	1	
R201	RK3542	Chip R.	ERJ2GEJ1222X	1	
R202	RK3542	Chip R.	ERJ2GEJ1222X	1	
R203	RK3556	Chip R.	ERJ2GEJ1333X	1	
R204	RK3562	Chip R.	ERJ2GEJ104X	1	
R206	RK0069	Chip R.	ERJ06EY104V	1	
R208	RK0005	Chip R.	ERJ06EY1220V	1	
R207	RK3552	Chip R.	ERJ2GEJ153X	1	
R209	RK3536	Chip R.	ERJ2GEJ1681X	1	
R268	RK3561	Chip R.	ERJ2GEJ1823X	1	
R210	RK3542	Chip R.	ERJ2GEJ1222X	1	
R211	RK4018	Chip R.	ERJ12YJ220U	1	
R212	RK4026	Chip R.	ERJ12YJ101U	1	
R213	RK3542	Chip R.	ERJ2GEJ1822X	1	
R214	RK3550	Chip R.	ERJ2GEJ103X	1	
R215	RK3536	Chip R.	ERJ2GEJ1681X	1	
R216	RK3050	Chip R.	MC080E2PJ103	1	
R217	RK3050	Chip R.	MC080E2PJ103	1	
R218	RK3554	Chip R.	ERJ2GEJ1223X	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
R219	RK3538	Chip R.	ERJ2GEJ102X	1	
R220	RK4034	Chip R.	ERJ12YJ471U	1	
R222	RK3550	Chip R.	ERJ2GEJ103X	1	
R223	RK3526	Chip R.	ERJ2GEJ101X	1	
R224	RK3530	Chip R.	ERJ2GEJ221X	1	
R225	RK3550	Chip R.	ERJ2GEJ103X	1	
R226	RK3038	Chip R.	MCR03EZPJ102	1	
R227	RK3501	Chip R.	ERJ2GE0R00X	1	
R228	RK3538	Chip R.	ERJ2GEJ102X	1	
R229	RK3550	Chip R.	ERJ2GEJ103X	1	
R230	RK3546	Chip R.	ERJ2GEJ472X	1	
R231	RK3050	Chip R.	MCR03EZPJ103	1	
R232	RK3522	Chip R.	ERJ2GEJ470X	1	
R233	RK3542	Chip R.	ERJ2GEJ222X	1	
R234	RK3558	Chip R.	ERJ2GEJ333X	1	
R235	RK3556	Chip R.	ERJ2GEJ333X	1	
R236	RK3551	Chip R.	ERJ2GEJ123X	1	
R237	RK3526	Chip R.	ERJ2GEJ101X	1	
R238	RK3562	Chip R.	ERJ2GEJ104X	1	
R239	RK3550	Chip R.	ERJ2GEJ103X	1	
R241	RK3550	Chip R.	ERJ2GEJ103X	1	
R242	RK3522	Chip R.	ERJ2GEJ470X	1	
R243	RK3554	Chip R.	ERJ2GEJ223X	1	
R244	RK3568	Chip R.	ERJ2GEJ334X	1	
R245	RK3538	Chip R.	ERJ2GEJ102X	1	
R246	RK3546	Chip R.	ERJ2GEJ472X	1	
R247	RK3538	Chip R.	ERJ2GEJ102X	1	
R249	RK3084	Chip R.	MCR03EZPJ154	1	
R251	RK3550	Chip R.	ERJ2GEJ103X	1	
R253	RK3557	Chip R.	ERJ2GEJ393X	1	
R254	RK3557	Chip R.	ERJ2GEJ393X	1	
R255	RK3546	Chip R.	ERJ2GEJ472X	1	
R256	RK3526	Chip R.	ERJ2GEJ101X	1	
R257	RK3547	Chip R.	ERJ2GEJ562X	1	
R258	RK3557	Chip R.	ERJ2GEJ393X	1	
R259	RK3550	Chip R.	ERJ2GEJ103X	1	
R260	RK3550	Chip R.	ERJ2GEJ103X	1	
R261	RK3554	Chip R.	ERJ2GEJ223X	1	
R282	RK3568	Chip R.	ERJ2GEJ334X	1	
R284	RK3538	Chip R.	ERJ2GEJ102X	1	
R286	RK3550	Chip R.	ERJ2GEJ103X	1	
R287	RK3522	Chip R.	ERJ2GEJ470X	1	
R288	RK3550	Chip R.	ERJ2GEJ103X	1	
R289	RK3550	Chip R.	ERJ2GEJ103X	1	
R290	RK3550	Chip R.	ERJ2GEJ103X	1	
R291	RK3550	Chip R.	ERJ2GEJ103X	1	
R292	RK3550	Chip R.	ERJ2GEJ103X	1	
R293	RK3550	Chip R.	ERJ2GEJ103X	1	
R294	RK3546	Chip R.	ERJ2GEJ472X	1	
R296	RK3568	Chip R.	ERJ2GEJ334X	1	
R297	RK3532	Chip R.	ERJ2GEJ331X	1	
R299	RK3545	Chip R.	ERJ2GEJ392X	1	
R300	RK3558	Chip R.	ERJ2GEJ473X	1	
R301	RK3538	Chip R.	ERJ2GEJ102X	1	
R302	RK3522	Chip R.	ERJ2GEJ470X	1	
R303	RK3549	Chip R.	ERJ2GEJ822X	1	
R304	RK3549	Chip R.	ERJ2GEJ822X	1	
R307	RK3541	Chip R.	ERJ2GEJ182X	1	
R308	RK3530	Chip R.	ERJ2GEJ221X	1	
R309	RK3550	Chip R.	ERJ2GEJ103X	1	
R311	RK3538	Chip R.	ERJ2GEJ102X	1	
R312	RK3538	Chip R.	ERJ2GEJ102X	1	
R313	RK3538	Chip R.	ERJ2GEJ102X	1	
R315	RK3544	Chip R.	ERJ2GEJ332X	1	
R318	RK3568	Chip R.	ERJ2GEJ334X	1	
R319	RK3561	Chip R.	ERJ2GEJ823X	1	
R320	RK3562	Chip R.	ERJ2GEJ104X	1	
R321	RK3543	Chip R.	ERJ2GEJ272X	1	
R322	RD0108	Jumper	J16ZC	1	
R323	RK3554	Chip R.	ERJ2GEJ223X	1	
R325	RK3566	Chip R.	ERJ2GEJ224X	1	
R337	RK3570	Chip R.	ERJ2GEJ474X	1	
R339	RK3550	Chip R.	ERJ2GEJ103X	1	
R340	RK3550	Chip R.	ERJ2GEJ103X	1	
R341	RK3561	Chip R.	ERJ2GEJ823X	1	
R342	RK3545	Chip R.	ERJ2GEJ392X	1	
R344	RK3550	Chip R.	ERJ2GEJ103X	1	

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
R345	RK3501	Chip R.	ERJ2GE0R00X	1	
R346	RK3561	Chip R.	ERJ2GEJ823X	1	
R347	RK3551	Chip R.	ERJ2GEJ123X	1	
R348	RK3534	Chip R.	ERJ2GEJ471X	1	
R349	RK3562	Chip R.	ERJ2GEJ104X	1	
R401	RK3553	Chip R.	ERJ2GEJ183X	1	
R402	RK3551	Chip R.	ERJ2GEJ123X	1	
R403	RK3542	Chip R.	ERJ2GEJ222X	1	
R404	RK3562	Chip R.	ERJ2GEJ104X	1	
R405	RK3563	Chip R.	ERJ2GEJ124X	1	
R406	RK3559	Chip R.	ERJ2GEJ563X	1	
R407	RK3562	Chip R.	ERJ2GEJ104X	1	
R408	RK3558	Chip R.	ERJ2GEJ473X	1	
R409	RK3560	Chip R.	ERJ2GEJ683X	1	
R410	RK3557	Chip R.	ERJ2GEJ393X	1	
R411	RK3562	Chip R.	ERJ2GEJ104X	1	
R412	RK3550	Chip R.	ERJ2GEJ103X	1	
R413	RK3550	Chip R.	ERJ2GEJ103X	1	
R414	RK3566	Chip R.	ERJ2GEJ224X	1	
R415	RK3558	Chip R.	ERJ2GEJ473X	1	
R416	RK3550	Chip R.	ERJ2GEJ103X	1	
R417	RK3568	Chip R.	ERJ2GEJ334X	1	
R418	RK3560	Chip R.	ERJ2GEJ683X	1	
R419	RK3550	Chip R.	ERJ2GEJ103X	1	
R420	RK3574	Chip R.	ERJ2GEJ105X	1	
R421	RK3566	Chip R.	ERJ2GEJ224X	1	
R422	RK3562	Chip R.	ERJ2GEJ104X	1	
R429	RK3501	Chip R.	ERJ2GE0R00X	1	
R430	RK3538	Chip R.	ERJ2GEJ102X	1	
R431	RK3558	Chip R.	ERJ2GEJ473X	1	
R432	RK3550	Chip R.	ERJ2GEJ103X	1	
SH101	TS0172	Case	VCO CASE DR820	1	
TC102	CT0046	Trimmer C.	TC03C100A-TP02	1	
TC103	CT0046	Trimmer C.	TC03C100A-TP02	1	
TH101	XS0031	Chip	NTCG164BH682JT-S	1	
TH102	XS0050	Chip	NTCG164QH105JT-S	1	
VR101	RH0233	Trimmer R.	RH02B1C15X	1	
VR102	RH0231	Trimmer R.	RH02B1CS4X	1	
VR103	RH0229	Trimmer R.	RH02B1CJ4X	1	
VR104	RH0233	Trimmer R.	RH02B1C15X	1	
VR106	RH0231	Trimmer R.	RH02B1CS4X	1	
VR107	RH0225	Trimmer R.	RH02B1CS3X	1	
VR108	RH0233	Trimmer R.	RH02B1C15X	1	
VR109	RH0229	Trimmer R.	RH02B1CJ4X	1	
VR110	RH0233	Trimmer R.	RH02B1C15X	1	
X101	XK0002	Discriminator	CDBLB455KCAY07-B0	1	
X102	XQ0170	VCTCXO	GS46128 21.25M	1	
X104	XQ0058Z	Xtal	UM5 30.355MHZ	1	
XF101	XF0014Z	Xtal Filter	30M152A 30.85MHZ	1	
	FG0320	SP Cushion	SP CUSHION DR135	1	
	FG0327	Cushion	CUSHION DR135	1	
	SD0034	Spring	GND SPRING DR130	1	
	TZ0049	Dumper	SILICON DUMPER	3	
	UP0545	P.C. BOARD	DR435FX INTEGRATED	1	

## Mechanical Parts

Ref No.	Part No.	Description	Parts Name	Qty.	Ver.
				DR-135	DR-435
	ES0035	Speaker	57-8BC-35 ROHS	1	1
	UX1047	Wire	WIRE DR130	1	1
	AA0050	Screw	OH M2.6+6 FE/B.ZN	6	6
	AN0032	Nut	MIC NUT	1	1
	AU0001	Screw	PH/S B26+8 FEN	15	15
	AW0001	Screw	PH/D6 3+8 FE/N	2	2
	DP0127	LCD Panel	LCD PANNEL DR135	1	0
	DP0136	LCD Panel	LCD PANNEL DR435	0	1
	FF0015	Cloth	BLIND CLOTH DR110	3	3
	FF0017	Cloth	BLIND CLOTH DR570	1	1
	FG0273	Rubber	ON AIR KEY RUBBER	1	1
	FP0151	Panel	REAR PANEL DR135	1	1
	FP0188	Panel	JACK PANEL DR135	1	1
	KS0098	Bottom Case	BOTTOM CASE DR135	1	1
	KZ0105	Front Case	FRONT ASSY. DR135	1	1
	NK0072	Knob	VOL KNOB DR135	1	1
	NK0073	Knob	DIAL KNOB DR135	1	1
	SP0008	GND Terminal	GND TERM XM601	1	1
	SS0093	Chassis	CHASSIS DR135	1	1
	ST0085	SP Holder	SP HOLDER DR135	1	1
	ST0066	SP Fitting	SP FITTING DR135	1	1
	TG0034	SP Himeron	SP HIMERON DR135	1	1
	UE0258	ANT	FM-M.D.R-4)	1	1
	YZ0131	Tape	#9110 12X1MM	30	30
	DS0446	Label	NITTO MODEL PLATE(S)	1	1
	DS0446	Label	NITTO MODEL PLATE(S)	2	2
	PR0288	Label	SCREW STKR DX70	2	2
	PR0478	Label	SERIAL SEAL	1	1
	PR0610	Label	N-10X49SEAL(YELLOW)	1	1

## Packing Parts

Ref No.	Part No.	Description	Parts Name	Qty.		Ver.
				DR-135	DR-435	
	DS0446	Label	NITTO MODEL PLATE(S)	1.4	1.4	FXE
	HK0539	Package	PACKAGE DR135Z	1	0	
	HK0540	Package	PACKAGE DR435Z	0	1	
	HM0218Z	Carton Box	MASTER CARTON	0.2	0.2	
	HU0099Z	P.MTL/Carton	FRONT INNER DR605	1	1	FX
	HU0159Z	P.MTL/Carton	INNER DR135T	1	1	
	HU0161Z	P.MTL/Carton	INNER 5 PCS	0.4	0.4	
	PR0478	Label	SERIAL SEAL	1.2	1.2	
	PR0513	Label	NITTO 13X13 LABEL(W)	3	3	FX
	PR0513	Label	NITTO 13X13 LABEL(W)	4	4	FXE
	PR0514	Label	EPSON 10X49 LABEL(W)	2	2	FXE
	PR0635	Label	N-30*50	1	1	

## ACCESSORIES

Ref No.	Part No.	Description	Parts Name	Qty.		Ver.
				DR-135	DR-435	
	ADFM78	Bracket	BRACKET DR130	1	1	
	ADUA38	Power Cable	R-32.0X3M RECEPT.15A	1	1	
	EHM53B	Microphone	MICROPHON EMS53B	1	1	
	HP0009	Plastic Bag	PLA.BAG 5X125X250	1	1	
	HP0035	Plastic Bag	E.BAG 5X200X250	1	1	FXE
	PK0111	Diagram	SCHEMATIC DR135MK3	1	0	
	PK0113	Diagram	SCHEMATIC DR435MK3	0	1	FXE
	PS0513A	Manual	INSTRUCTION	1	1	

## ACCESSORIES (SCREW SET)

Ref No.	Part No.	Description	Parts Name	Qty.		Ver.
				DR-135	DR-435	
	AA0013	Screw	BH M5*20 FE/ZN	4	4	
	AE0012	Screw	HEXHD M4*8 FE/3BBC	4	4	
	AJ0003	Screw	BH T5*20 FE/ZN 1	4	4	
	AN0002	Nut	HEX N5X0.8 FE/ZN	4	4	
	AZ0009	Washer	SW 5X9.2X1.3 FE/ZN	4	4	
	AZ0010	Washer	SW 5X12X0.8 FE/ZN	4	4	
	EF0005	Fuse	FGBO 15A	2	2	
	FM0079Z	Spanner	SPANNER DR130	1	1	
	HP0006	Plastic Bag	5X90X170	1	1	
	YZ0121	Tape	TAPE 10MM	2	2	

## DR-135 ADJUSTMENT

### 1) Adjustment Spot

Power Supply Voltage 13.8V

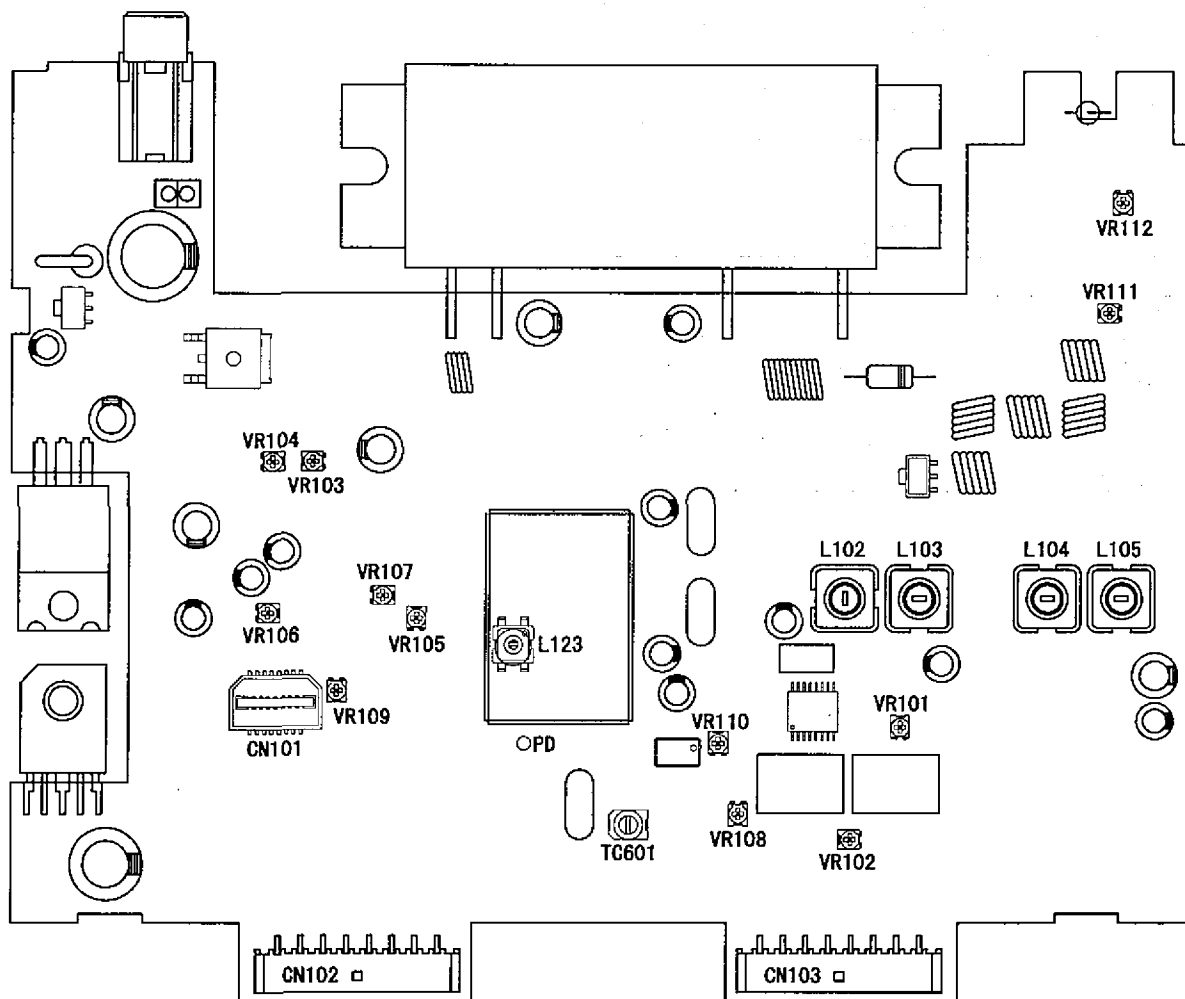
Output of SSG is all EMF indication.

If without instruction, WIDE mode.

If without instruction, SSG output is MOD 1KHz WIDE DEV 3.5KHz/DEV,  
NARROW DEV 1.75KHz/DEV.

Standard modulation is also based above.

Speaker load is 8 ohm and output is 50 ~ 100 mV.





## 2) VCO and RX Adjustment Specification

ITEM	CONDITION	UNIT	ADJ. SPOT	ADJUSTING MRTHOD
Adjustment Frequency	145.90MHz TX	MAIN	TC601	Adjust so that Tx Frequency becomes within 145.90MHz +/- 100Hz
VCO Adjustment	146.00MHz RX	MAIN	L123	Adjust so that PD voltage becomes 2.7V
VCO Confirmation	173.99MHz RX	MAIN		Confirm if PD voltage becomes less than 7.3V
Rx Signal Sensitivity Adjustment	146.05MHz  136.05MHz 146.05MHz 173.95MHz	MAIN	L105, L104 L103, L102	Repeatedly adjust so that the Rx sensitivity becomes in maximum/. Confirm: At -7dBu SINAD more than 12dB At -8dBu SINAD more than 12dB At -6dBu SINAD more than 12dB
Squelch Adjustment	146.05MHz SSG OFF Indicate 01	MAIN	VR101	Adjust so that the squelch stops at perfectly close location
S Meter Adjustment	146.05MHz SSG 20dBu 1KHz Indicate 01	MAIN	VR102	Adjust so that all the indicator appears

## 3) TX Adjustment Specification

ITEM	CONDITION	UNIT	ADJ. SPOT	ADJUSTING MRTHOD
HI POWER Adjustment	146.00MHz HI POWER	MAIN	VR103	Adjust to 50.0 +/- 1.0W
MID POWER Adjustment	146.00MHz MID POWER	MAIN	VR104	Adjust to 20.0 +/- 1.0W
LOW POWER Confirmation	146.00MHz LOW POWER	MAIN		Confirm if it becomes 5.0 +/- 1.0W
Maximum Deviation Adjustment	146.00MHz MOD 1KHz 40mVemf WIDE	MAIN	VR107	4.5 +/- 0.1KHz/DEV
Maximum Deviation Confirmation	146.00MHz MOD 1KHz 40mVemf NARROW	MAIN		2.2 +/- 0.2KHz/DEV
Mic Gain Adjustment	146.00MHz MOD 1KHz 4mVemf WIDE	MAIN	VR106	3.0 +/- 0.1KHz/DEV
CTCSS Modulation Level Confirmation	146.00MHz 88.5Hz	MAIN		800 +/- 200Hz/DEV 3KHz LPF ON
DCS Modulation Level Adjustment	146.00MHz 255 Code	MAIN	VR108	800 +/- 50Hz/DEV 3KHz LPF ON
1750Hz Modulation Level Adjustment	146.00MHz 1750Hz	MAIN	VR109	3.0 +/- 0.5KHz/DEV
DTMF Modulation Level Confirmation	146.00MHz DTMF 1 Press the V/M key during TX	MAIN		3.0 +/- 0.5KHz/DEV

#### 4) RX Test Specification

TEST ITEM	CONDITION	ADJ. STANDARD	TEST STANDARD	NOTE
RX Signal Sensitivity	136.05MHz 146.05MHz 173.95MHz	Less than -7dBu Less than -8dBu Less than -6dBu	Less than -6dBu Less than -7dBu Less than -5dBu	12dB SINAD
	146.05MHz NARROW	Less than -8dBu	Less than -7dBu	
RX Distortion	146.05MHz WIDE NARROW	Less than 4%	Less than 5%	SSG Output 30dBu
RX S/N	146.05MHz WIDE	More than 40dB	More than 38dB	SSG Output 30dBu 0.3 ~ 3KHz BPF OFF
	146.00MHz NARROW	More than 34dB	More than 32dB	
Squelch Sensitivity	146.05MHz Indication 02	Squelch Open	Squelch Open	SSG Output -10dBu
		Squelch Close	Squelch Close	SSG Output OFF
S Meter	146.05MHz 1KHz 3.5KHz/DEV	All appears at 20dBu	All appears at 25dBu	Decrease SSG level and decrease S Meter level
AF Output	146.05MHz	More than 2W	More than 2W	SSG Output 30dBu
CTCSS Sensitivity	146.05MHz WIDE	Open at 500Hz/DEV	Open at 500Hz/DEV	SSG Output 0dBu 88.5Hz
	146.05MHz NARROW	Open at 250Hz/DEV	Open at 250Hz/DEV	
DCS Sensitivity	146.05MHz WIDE	Opens when Test Equipment is in TX	Opens when Test Equipment is in TX	255 Code
	146.05MHz NARROW	Opens when Test Equipment is in TX	Opens when Test Equipment is in TX	
Drain Current	146.05MHz	Less than 0.65A	Less than 0.65A	Max volume
Power off Current	146.05MHz	Less than 10mA	Less than 10mA	Power off
Howling	146.05MHz	Don't occur	Don't occur	SSG Output 60dBu Mod off, Max volume

## 5) TX Test Specification

TEST ITEM	CONDITION	ADJ. STANDARD	TEST STANDARD	NOTE
Tx Output HI POWER	144.00MHz 146.00MHz 148.00MHz	50 +/- 1W	50 +/- 3W 50 +/- 3W 50 +/- 3W	
Tx Output MID POWER	146.00MHz	20 +/- 1W	20 +/- 2W	
Tx Output LOW POWER	146.00MHz	5 +/- 1W	3 ~ 6W	
Drain Current	146.00MHz	Less than 11A	Less than 12A	
Frequency Deviation	146.00MHz	Within +/- 0.1KHz	Within +/- 0.5KHz	
Spurious	144.00MHz 146.00MHz 148.00MHz	More than 65dB More than 65dB More than 65dB	More than 60dB More than 60dB More than 60dB	MID and LOW standard power is also the same as of HI power level
Modulation Level	146.00MHz WIDE	3.0 +/- 0.1KHz/DEV 4.5 +/- 0.1KHz/DEV	3.0 +/- 0.2KHz/DEV 4.5 +/- 0.2KHz/DEV	MIC in 1KHz 4mVemf MIC in 1KHz 40mVemf
	146.00MHz NARROW	2.2 +/- 0.2KHz/DEV	2.2 +/- 0.3KHz/DEV	MIC in 1KHz 40mVemf
CTCSS Modulation Level	146.00MHz WIDE	800 +/- 200Hz/DEV	800 +/- 200Hz/DEV	88.5Hz 3KHz LPF ON
DCS Modulation Level	146.00MHz WIDE	800 +/- 200Hz/DEV	800 +/- 200Hz/DEV	255 Code 3KHz LPF ON
	146.00MHz NARROW	450 +/- 100Hz/DEV	450 +/- 100Hz/DEV	
1750Hz Modulation Level	146.00MHz WIDE	3.0 +/- 0.5KHz/DEV	3.0 +/- 0.5KHz/DEV	
DTMF Modulation Level	146.00MHz WIDE	3.0 +/- 0.5KHz/DEV	3.0 +/- 0.5KHz/DEV	Press the V/M key during TX
Modulation Distortion	146.00MHz WIDE	Less than 3%	Less than 4%	
TX S/N	146.00MHz WIDE	More than 40dB	More than 38dB	0.3 ~ 3KHz BPF ON
	146.00MHz NARROW	More than 34dB	More than 32dB	

## DR-435 ADJUSTMENT

### 1) Adjustment Spot

Power Supply Voltage 13.8V

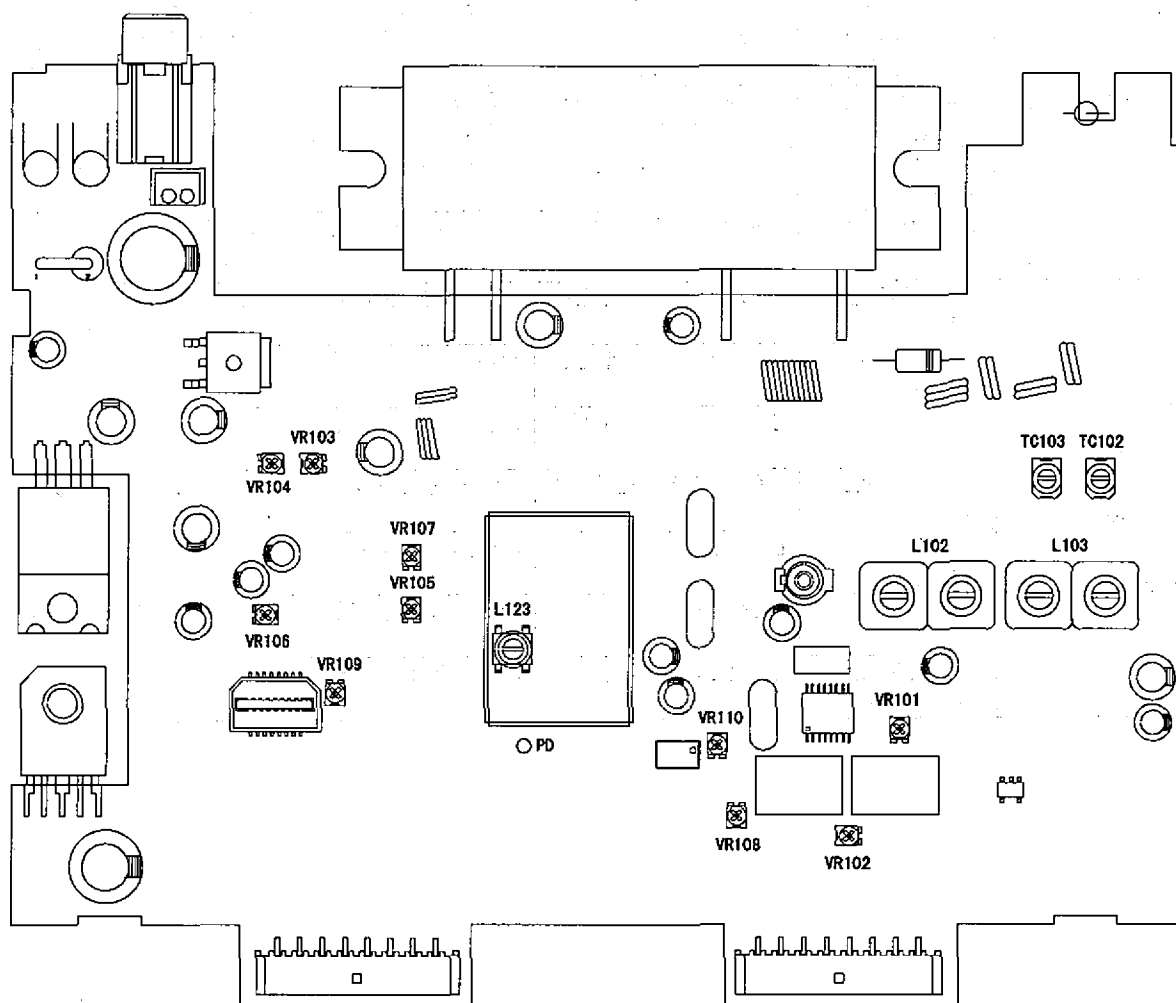
Output of SSG is all EMF indication.

If without instruction, WIDE mode.

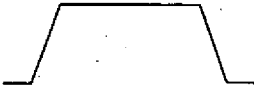
If without instruction, SSG output is MOD 1KHz WIDE DEV 3.5KHz/DEV,  
NARROW DEV 1.75KHz/DEV.

Standard modulation is also based above.

Speaker load is 8 ohm and output is 50 ~ 100 mV.



## 2) VCO and RX Adjustment Specification

ITEM	CONDITION	UNIT	ADJ. SPOT	ADJUSTING MRTHOD
Adjustment Frequency	439.90MHz TX	MAIN	VR110	Adjust so that Tx Frequency becomes within 439.90MHz +/- 100Hz
VCO Adjustment	425.00MHz RX	MAIN	L123	Adjust so that PD voltage becomes 2.0V
VCO Confirmation	511.99MHz RX	MAIN		Confirm if PD voltage becomes less than 9.0V
Rx Signal Sensitivity Adjustment	440.05MHz  430.05MHz 440.05MHz 450.05MHz	MAIN	TC103, TC102 L103, L102	<p>It is a tracking generator from an antenna connector. -30dBm is inputted. And when CN109 is seen with a spectrum analyzer, by the maximum gain, it becomes as it is shown in the following figure, and appearance adjustment is carried out.</p>  <p>430.00MHz                      450.00MHz</p> <p>At -7.5dBu SINAD more than 12dB At -7.5dBu SINAD more than 12dB At -7.5dBu SINAD more than 12dB</p>
Squelch Adjustment	440.05MHz SSG OFF Indicate 01	MAIN	VR101	Adjust so that the squelch stops at perfectly close location
S Meter Adjustment	440.05MHz SSG 20dBu 1KHz Indicate 01	MAIN	VR102	Adjust so that all the indicator appears

### 3) TX Adjustment Specification

ITEM	CONDITION	UNIT	ADJ. SPOT	ADJUSTING MRTHOD
HI POWER Adjustment	440.00MHz HI POWER	MAIN	VR103	Adjust to 35.0 +/- 1.0W
MID POWER Adjustment	440.00MHz MID POWER	MAIN	VR104	Adjust to 20.0 +/- 1.0W
LOW POWER Confirmation	440.00MHz LOW POWER	MAIN		Confirm if it becomes 5.0 +/- 1.0W
Maximum Deviation Adjustment	440.00MHz MOD 1KHz 40mVemf WIDE	MAIN	VR107	4.5 +/- 0.1KHz/DEV
Maximum Deviation Confirmation	440.00MHz MOD 1KHz 40mVemf NARROW	MAIN		2.2 +/- 0.2KHz/DEV
Mic Gain Adjustment	440.00MHz MOD 1KHz 4mVemf WIDE	MAIN	VR106	3.0 +/- 0.1KHz/DEV
CTCSS Modulation Level Confirmation	440.00MHz 88.5Hz	MAIN		800 +/- 200Hz/DEV 3KHz LPF ON
DCS Modulation Level Adjustment	440.00MHz 255 Code	MAIN	VR108	800 +/- 50Hz/DEV 3KHz LPF ON
1750Hz Modulation Level Adjustment	440.00MHz 1750Hz	MAIN	VR109	3.0 +/- 0.5KHz/DEV
DTMF Modulation Level Confirmation	440.00MHz DTMF 1 Press the V/M key during TX	MAIN		3.0 +/- 0.5KHz/DEV

#### 4) RX Test Specification

TEST ITEM	CONDITION	ADJ. STANDARD	TEST STANDARD	NOTE
RX Signal Sensitivity	350.05MHz	Less than -1.0dBu	Less than +0.0dBu	12dB SINAD
	430.05MHz	Less than -7.5dBu	Less than -6.5dBu	
	440.05MHz	Less than -7.5dBu	Less than -6.5dBu	
	450.05MHz	Less than -7.5dBu	Less than -6.5dBu	
	511.95MHz	Less than +1.0dBu	Less than +2.0dBu	
	440.05MHz NARROW	Less than -8dBu	Less than -7dBu	
RX Distortion	440.05MHz WIDE NARROW	Less than 4%	Less than 5%	SSG Output 40dBu
RX S/N	440.05MHz WIDE	More than 40dB	More than 38dB	SSG Output 40dBu 0.3 ~ 3KHz BPF OFF
	440.00MHz NARROW	More than 34dB	More than 32dB	
Squelch Sensitivity	440.05MHz Indication 02	Squelch Open	Squelch Open	SSG Output -10dBu
		Squelch Close	Squelch Close	SSG Output OFF
S Meter	440.05MHz 1KHz 3.5KHz/DEV	All appears at 20dBu	All appears at 25dBu	Decrease SSG level and decrease S Meter level
AF Output	440.05MHz	More than 2W	More than 2W	SSG Output 30dBu
CTCSS Sensitivity	440.05MHz WIDE	Open at 500Hz/DEV	Open at 500Hz/DEV	SSG Output 0dBu 88.5Hz
	440.05MHz NARROW	Open at 250Hz/DEV	Open at 250Hz/DEV	
DCS Sensitivity	440.05MHz WIDE	Opens when Test Equipment is in TX	Opens when Test Equipment is in TX	255 Code
	440.05MHz NARROW	Opens when Test Equipment is in TX	Opens when Test Equipment is in TX	
Drain Current	440.05MHz	Less than 0.65A	Less than 0.65A	Max volume
Power off Current	440.05MHz	Less than 10mA	Less than 10mA	Power off
Howling	440.05MHz	Don't occur	Don't occur	SSG Output 60dBu Mod off, Max volume

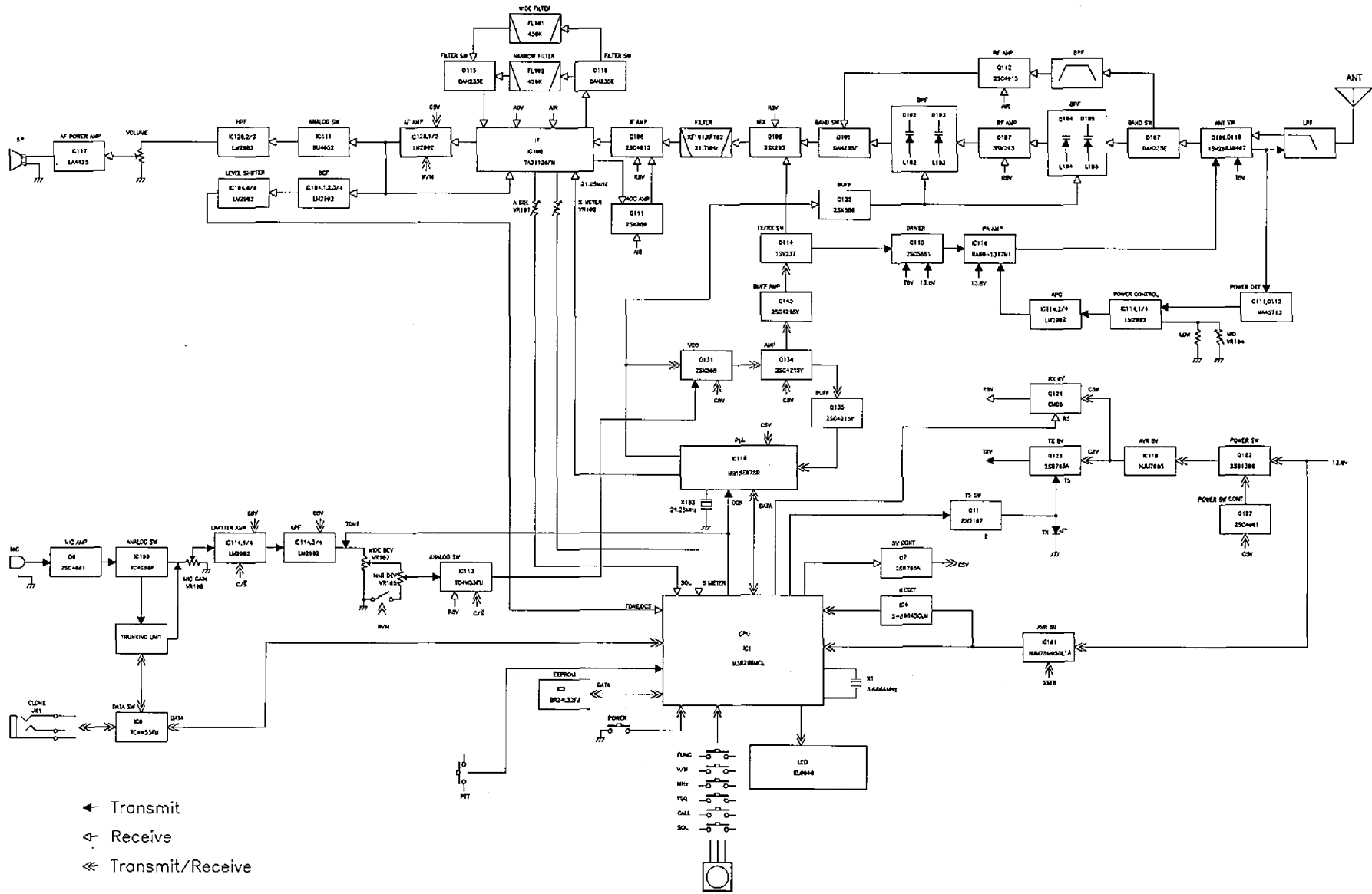
## 5) TX Test Specification

TEST ITEM	CONDITION	ADJ. STANDARD	TEST STANDARD	NOTE
Tx Output HI POWER	430.00MHz 440.00MHz 450.00MHz	35 +/- 1W	35 +/- 5W 35 +/- 3W 35 +/- 5W	
Tx Output MID POWER	440.00MHz	20 +/- 1W	20 +/- 2W	
Tx Output LOW POWER	440.00MHz	5 +/- 1W	3 ~ 6W	
Drain Current	440.00MHz	Less than 11A	Less than 12A	
Frequency Deviation	440.00MHz	Within +/- 0.1KHz	Within +/- 0.3KHz	
Spurious	430.00MHz 440.00MHz 450.00MHz	More than 65dB More than 65dB More than 65dB	More than 60dB More than 60dB More than 60dB	MID and LOW standard power is also the same as of HI power level
Modulation Level	440.00MHz	3.0 +/- 0.1KHz/DEV	3.0 +/- 0.2KHz/DEV	MIC in 1KHz 4mV <sub>rms</sub>
	WIDE	4.5 +/- 0.1KHz/DEV	4.5 +/- 0.2KHz/DEV	MIC in 1KHz 40mV <sub>rms</sub>
	440.00MHz NARROW	2.2 +/- 0.2KHz/DEV	2.2 +/- 0.3KHz/DEV	MIC in 1KHz 40mV <sub>rms</sub>
CTCSS Modulation Level	440.00MHz WIDE	800 +/- 200Hz/DEV	800 +/- 200Hz/DEV	88.5Hz 3KHz LPF ON
DCS Modulation Level	440.00MHz WIDE	800 +/- 200Hz/DEV	800 +/- 200Hz/DEV	255 Code 3KHz LPF ON
	440.00MHz NARROW	450 +/- 100Hz/DEV	450 +/- 100Hz/DEV	
1750Hz Modulation Level	440.00MHz WIDE	3.0 +/- 0.5KHz/DEV	3.0 +/- 0.5KHz/DEV	
DTMF Modulation Level	440.00MHz WIDE	3.0 +/- 0.5KHz/DEV	3.0 +/- 0.5KHz/DEV	Press the V/M key during TX
Modulation Distortion	440.00MHz WIDE	Less than 3%	Less than 4%	
TX S/N	440.00MHz WIDE	More than 40dB	More than 38dB	0.3 ~ 3KHz BPF ON
	440.00MHz NARROW	More than 34dB	More than 32dB	

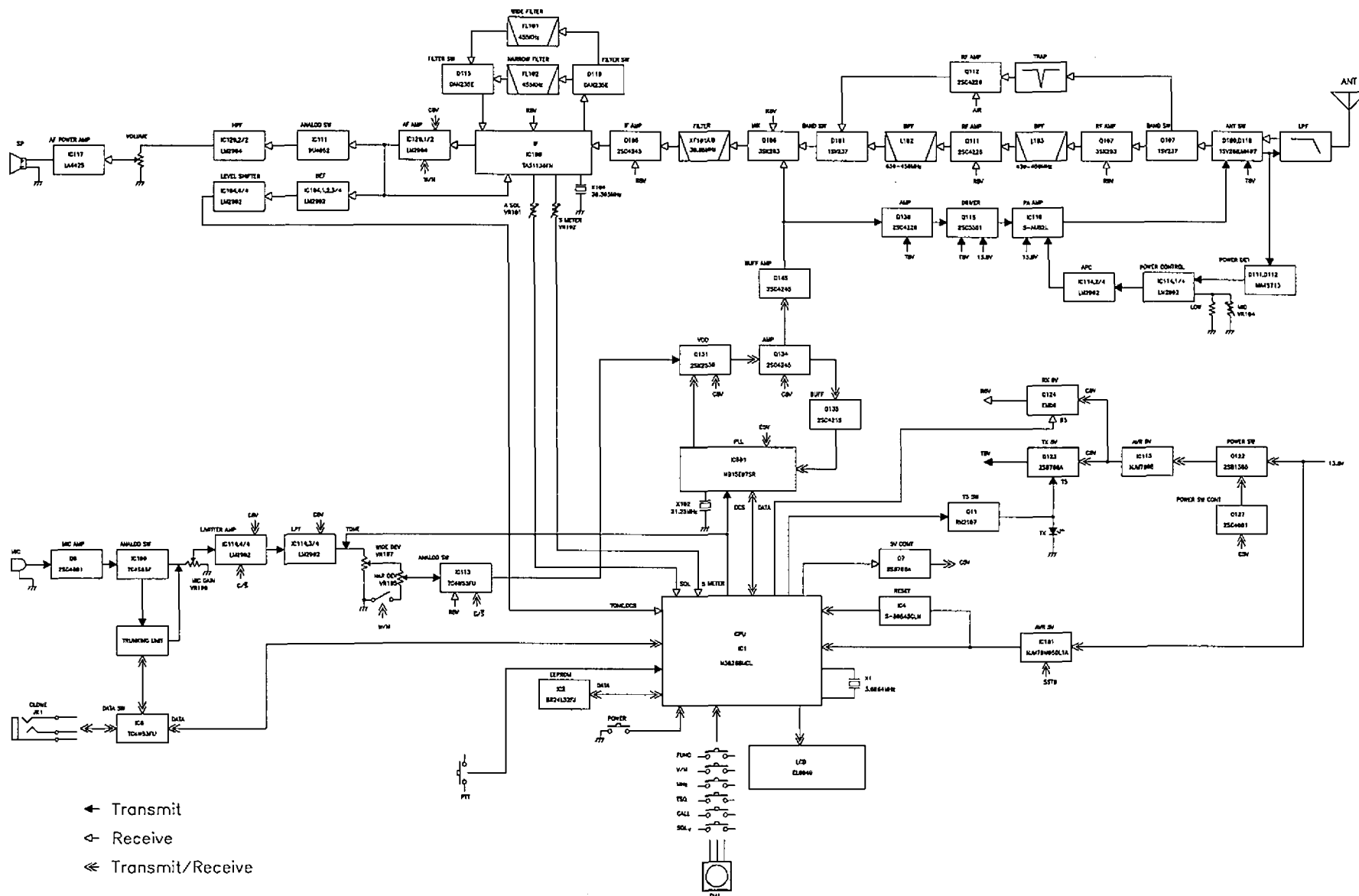


# BLOCK DIAGRAM

## 1) DR-135

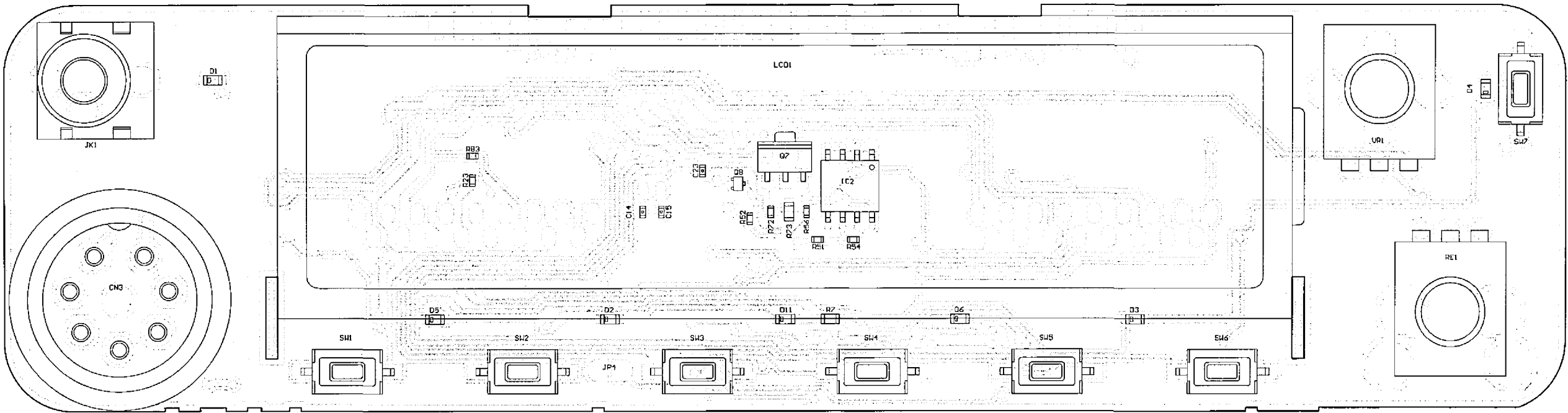


**2) DR-435**

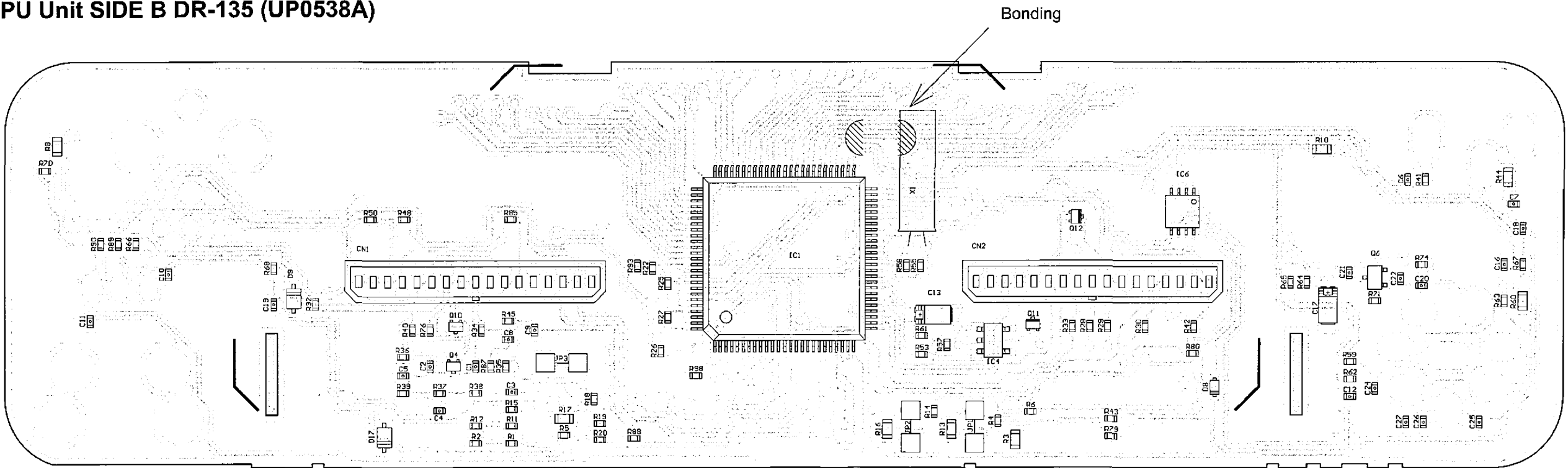


PC BOARD VIEW

1) CPU Unit SIDE A DR-135 (UP0538A)

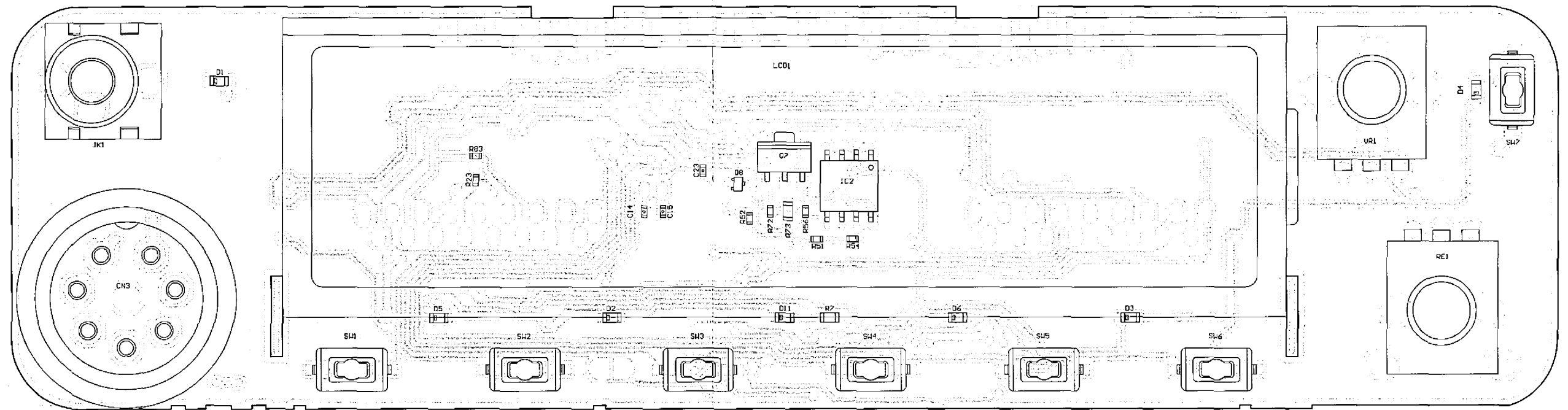


2) CPU Unit SIDE B DR-135 (UP0538A)

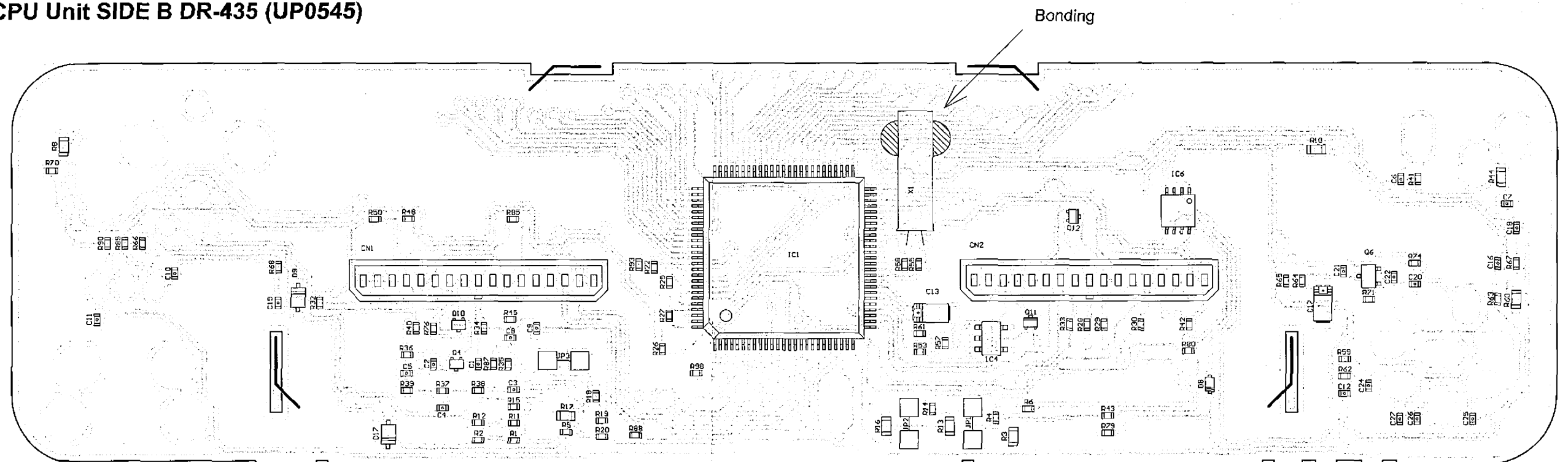


	R13	R16	JP3
DR135FX	NC	0	NC
DR135FXE	0	NC	JUMPER

### 3) CPU Unit SIDE A DR-435 (UP0545)



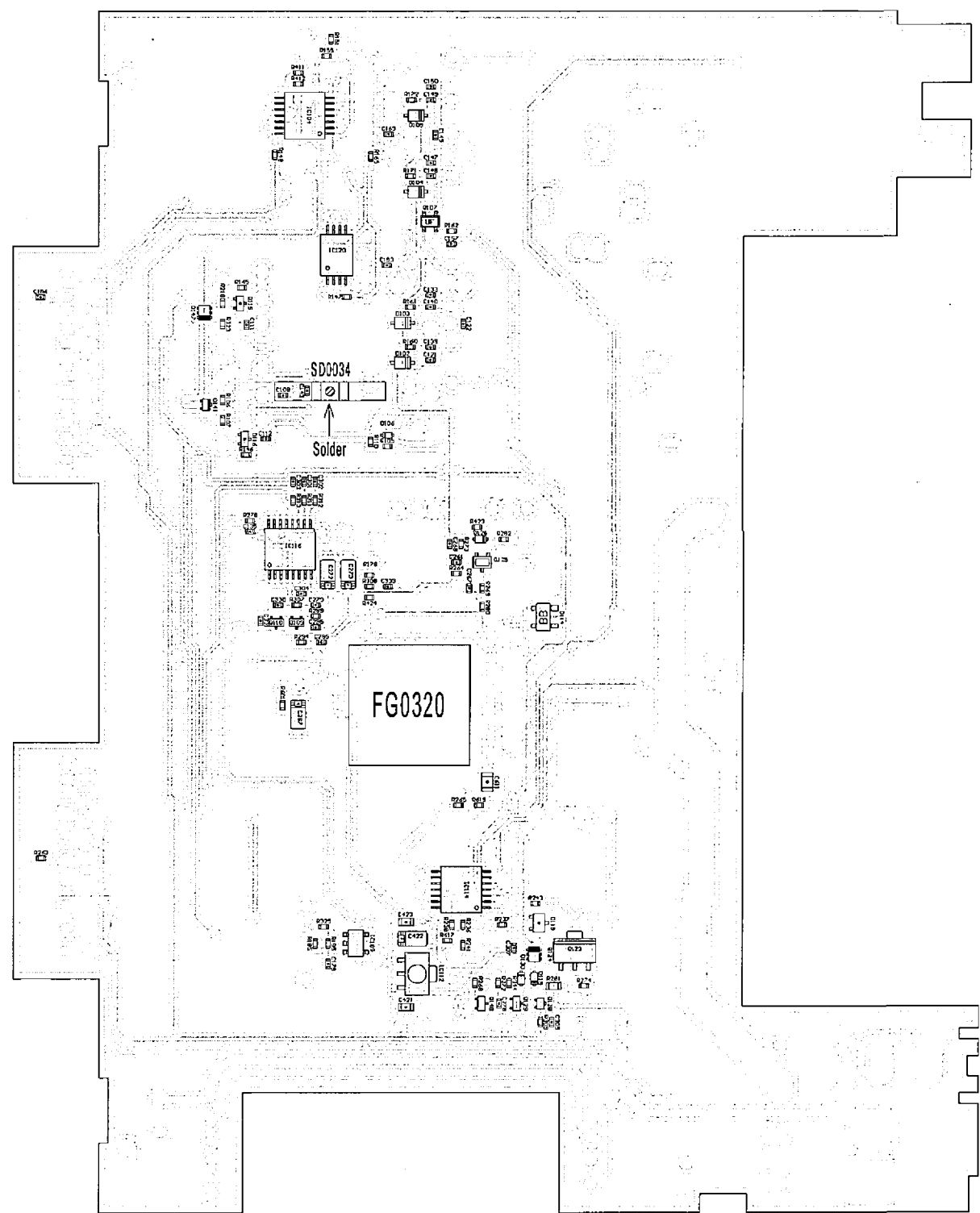
### 4) CPU Unit SIDE B DR-435 (UP0545)



	R13	R16	JP3
DR435FX	NC	0	NC
DR435FXE	0	NC	JUMPER

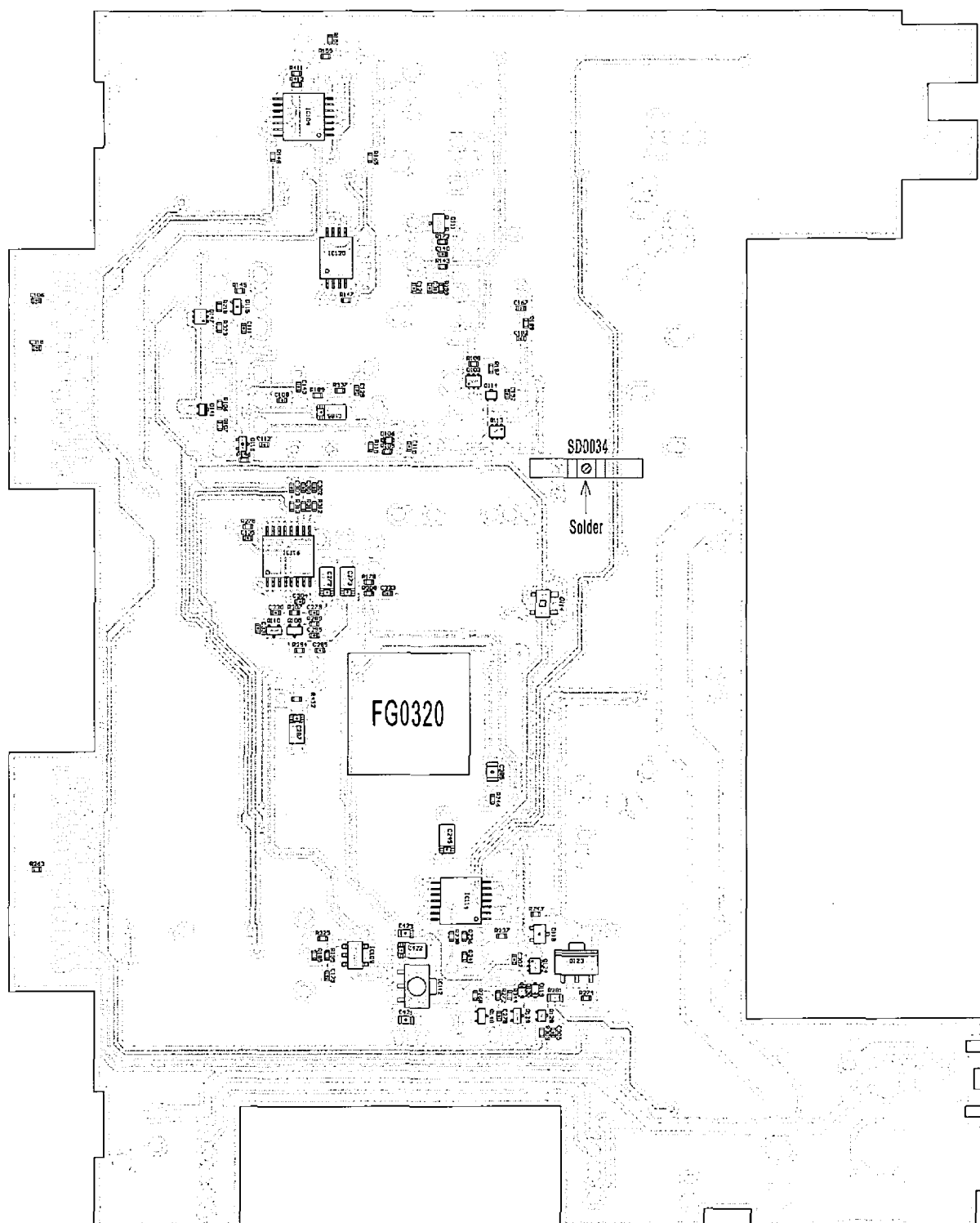


6) MAIN Unit Side B DR-135 (UP0538A)





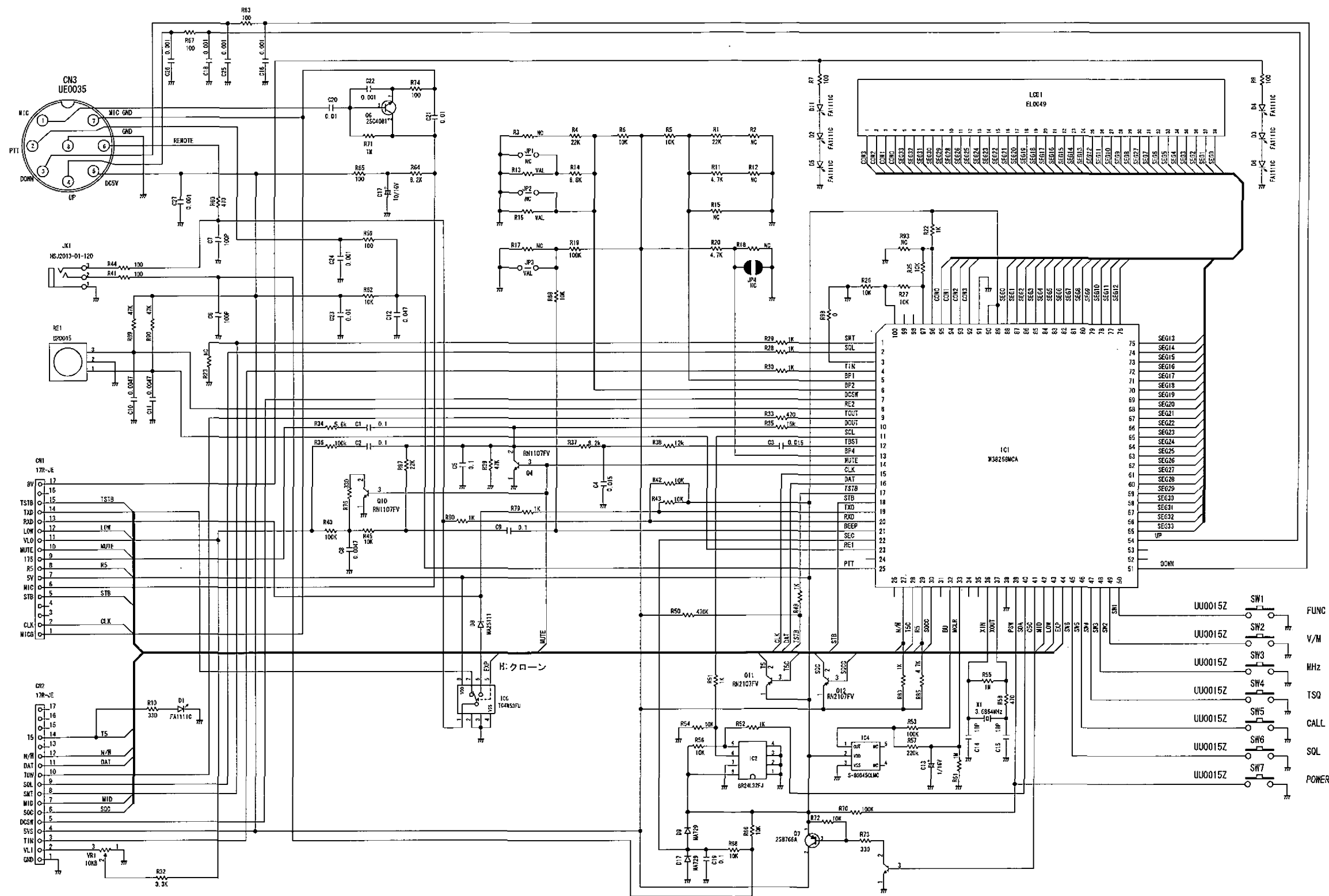
## 8) MAIN Unit Side B DR-435 (UP0545)





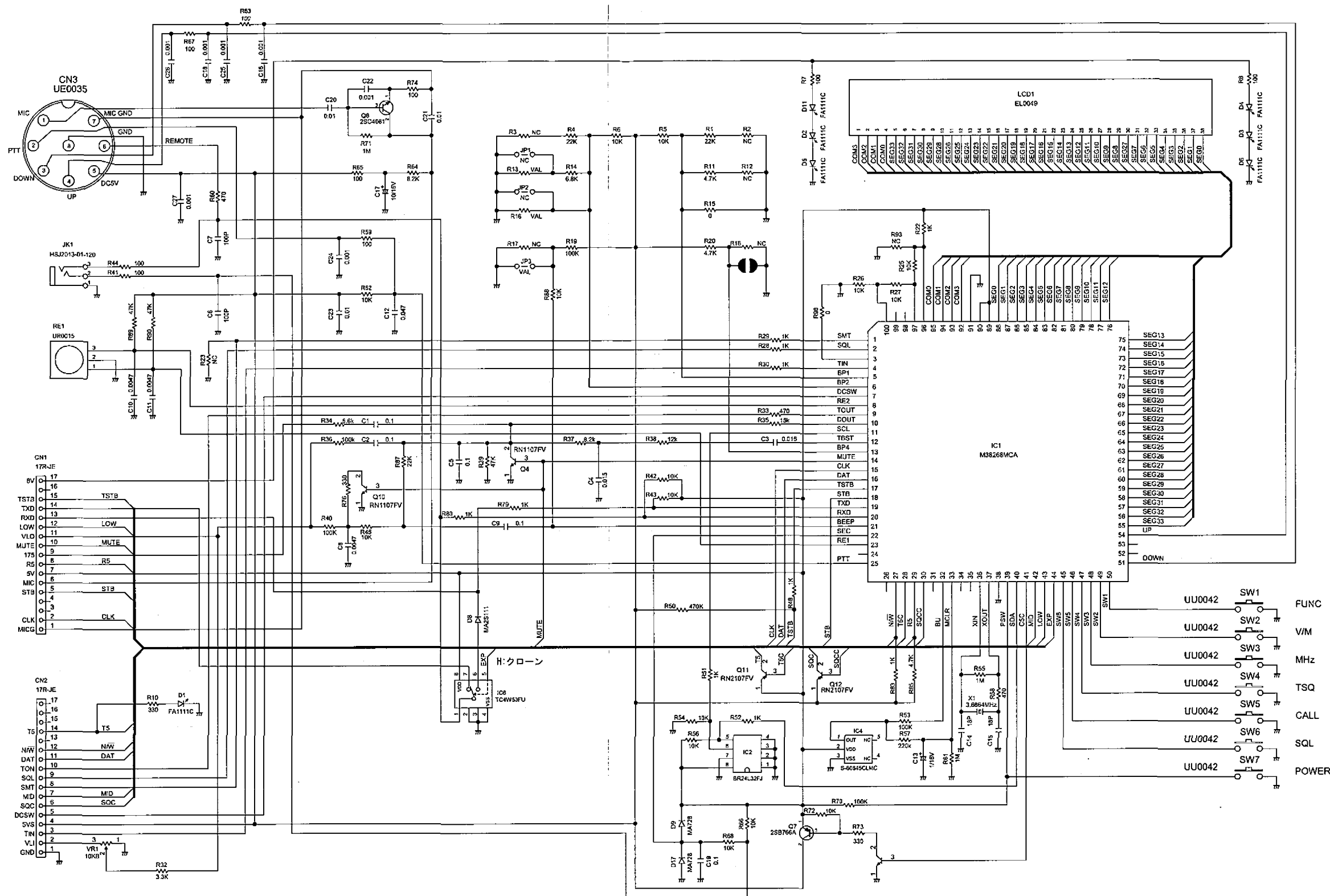
SCHEMATIC DIAGRAM

1) CPU Unit DR-135



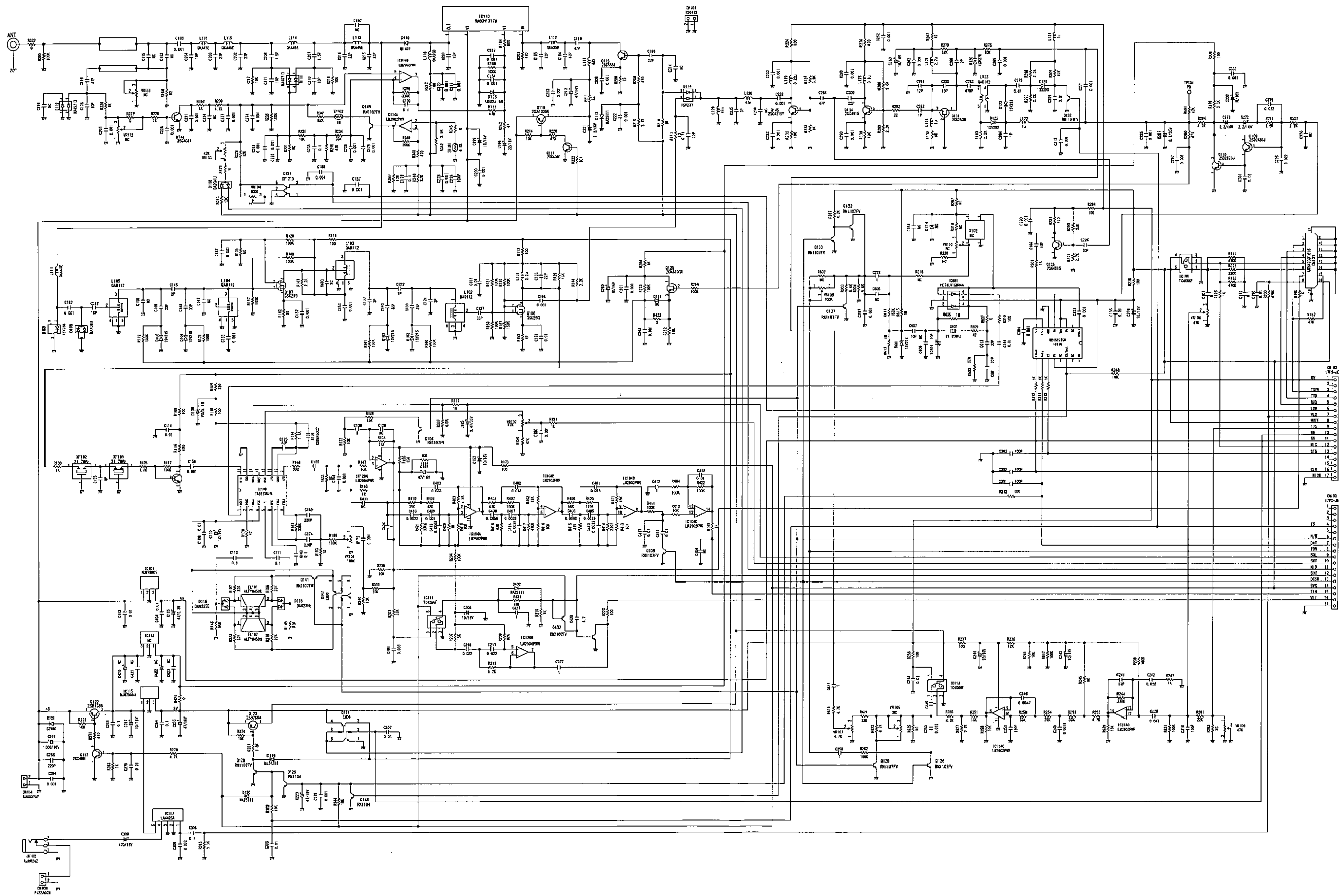
	R13	R16	JP3
DR135FX	NC	0	JUMPER
DR135FXE	0	NC	JUMPER

2) CPU Unit DR-435

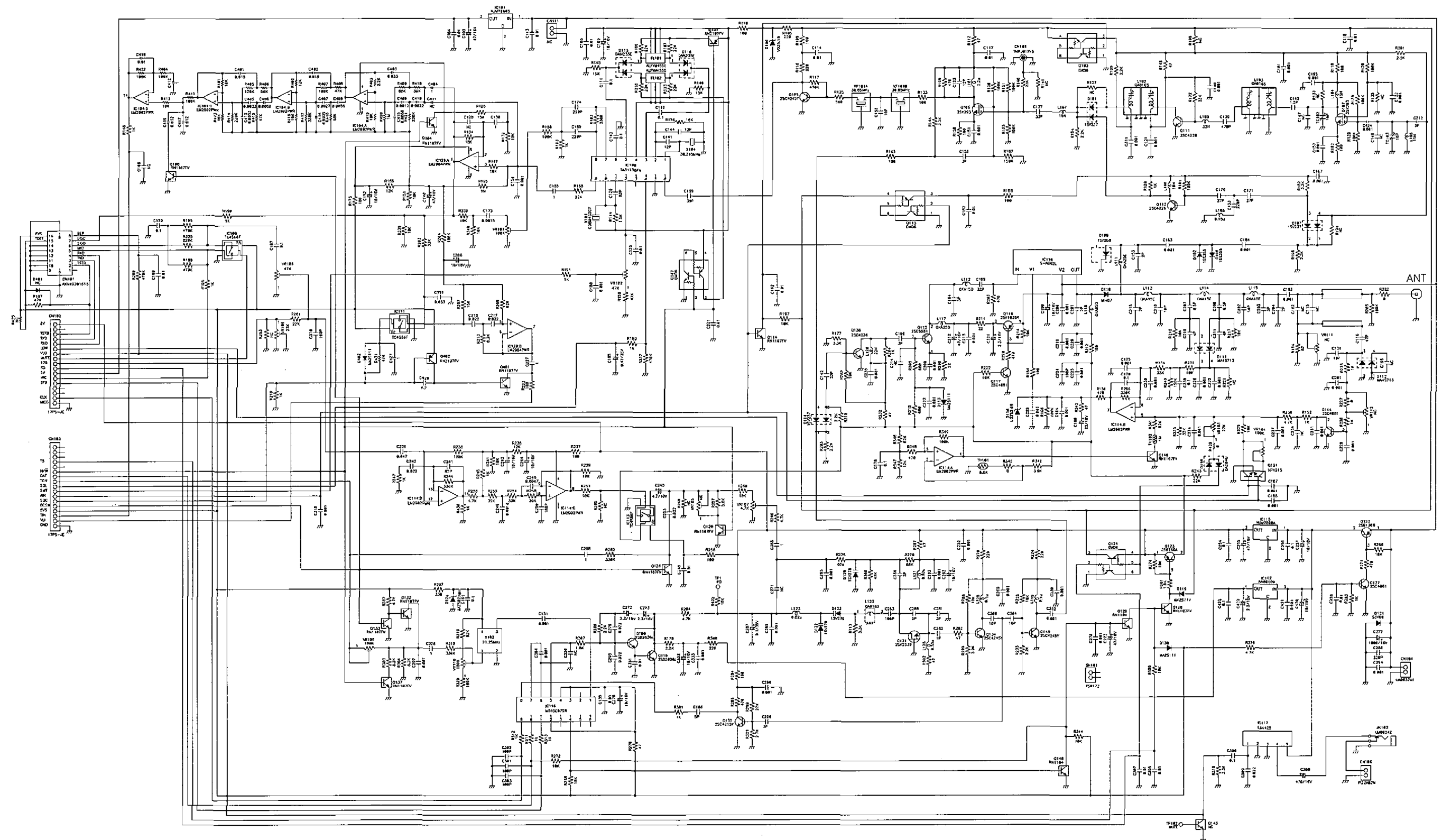


	R13	R16	JP3
DR435FX	NC	0	JUMPER
DR435FXE	0	NC	JUMPER

3) MAIN Unit DR-135



#### 4) MAIN Unit DR-435



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